

## Monitoring of Chinese White Dolphins in Southwest Lantau Waters

25<sup>th</sup> Monthly Progress Report (April 2017)

submitted to Environmental Project Office for the HZMB HKLR, HZMB HKBCF and TM-CLKL – Investigation

Submitted by

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### 1. Introduction

- 1.1. In March 2015, Hong Kong Cetacean Research Project (HKCRP) was appointed by the Environmental Project Office for the HZMB Hong Kong Projects to undertake a monitoring study of Chinese White Dolphins in Southwest Lantau (SWL) waters.
- 1.2. The objectives of the monitoring study are to quantify the abundance and density of Chinese White Dolphins in SWL waters, to identify individuals during the monitoring surveys, and to analyze their range use and movement patterns in Hong Kong and the wider Pearl River Estuary waters.
- 1.3. The monitoring study can supplement the on-going EM&A monitoring results of the HZMB Hong Kong Projects in North and West Lantau waters, and provide a more complete picture of dolphin usage and movements between different survey areas in western Hong Kong waters.
- 1.4. The present report is the 25<sup>th</sup> monthly progress report under this dolphin monitoring study submitted to the Environmental Project Office, summarizing the survey findings during the month of April 2017.

### 2. Monitoring Methodology

#### 2.1. Vessel-based Line-transect Survey

- 2.1.1. According to the requirement of the technical proposal submitted to the Environmental

Project Office, dolphin monitoring programme should cover all transect lines in SWL survey area (see Figure 1) once per month upon instruction. The co-ordinates of all transect lines conducted during the dolphin monitoring survey are shown in Table 1.

Table 1. Co-ordinates of transect lines in SWL survey area (corresponding to transect line layout as shown in Figure 1)

Line #		Northing	Easting		Line #		Northing	Easting
SWL001	1	806180	802510		SWL007	13	807380	808520
	2	804250	802510			14	805600	808520
SWL002	3	806710	803480		15	804400	808520	
	4	803450	803480		16	803000	808520	
SWL003	5	807270	804500		17	802100	808520	
	6	802690	804500		18	800470	808520	
SWL004	7	807590	805450		SWL008	19	807380	809550
	8	802295	805450			20	805050	809550
SWL005	9	808490	806500			21	804400	809550
	10	801410	806500			22	800470	809550
SWL006	11	808500	807430		SWL009	23	807380	810550
	12	801250	807430			24	800470	810550
					SWL010	25	809410	811510
						26	801470	811510

2.1.2. The HKCRP survey team used standard line-transect methods (Buckland et al. 2001) to conduct the systematic vessel surveys, and followed the same technique of data collection that has been adopted over the last 18 years of marine mammal monitoring surveys in Hong Kong developed by HKCRP (see Hung 2014). For each monitoring vessel survey, a 15-m inboard vessel with an open upper deck (about 4.5 m above water surface) was used to make observations from the flying bridge area.

2.1.3. Two experienced observers from HKCRP (a data recorder and a primary observer) made up the on-effort survey team, and the survey vessel transited different transect lines at a

constant speed of 13-15 km per hour. The data recorder searched with unaided eyes and filled out the datasheets, while the primary observer searched for dolphins and porpoises continuously through 7 x 50 *Fujinon* marine binoculars. Both observers searched the sea ahead of the vessel, between 270° and 90° (in relation to the bow, which is defined as 0°). One to two additional experienced observer was available on the boat to work in shift (i.e. rotate every 30 minutes) in order to minimize fatigue of the survey team members. All observers were experienced in small cetacean survey techniques and identifying local cetacean species.

- 2.1.4. During on-effort survey periods, the survey team recorded effort data including time, position (latitude and longitude), weather conditions (Beaufort sea state and visibility), and distance traveled in each series (a continuous period of search effort) with the assistance of a handheld GPS (*Garmin eTrex Legend*).
- 2.1.5. Data including time, position and vessel speed were also automatically and continuously logged by handheld GPS throughout the entire survey for subsequent review.
- 2.1.6. When dolphins were sighted, the survey team would end the survey effort, and immediately record the initial sighting distance and angle of the dolphin group from the survey vessel, as well as the sighting time and position. Then the research vessel was diverted from its course to approach the animals for species identification, group size estimation, assessment of group composition, and behavioural observations. The perpendicular distance (PSD) of the dolphin group to the transect line was later calculated from the initial sighting distance and angle.
- 2.1.7. Survey effort being conducted along the parallel transect lines that were perpendicular to the coastlines (as indicated in Figure 1) was labeled as “primary” survey effort, while the survey effort conducted along the connecting lines between parallel lines as well as the section around the Soko Islands was labeled as “secondary” survey effort. Both primary and secondary survey effort were presented as on-effort survey effort in this report.
- 2.1.8. Encounter rates of Chinese White Dolphins (number of on-effort sightings per 100 km of survey effort and number of dolphins from all on-effort sightings per 100 km of survey effort) were calculated in SWL survey area in relation to the amount of survey effort conducted during each month of monitoring survey. Only data collected under Beaufort 3 or below condition would be used for encounter rate analysis. Dolphin encounter rates were calculated using the combined survey effort from both primary and secondary lines for comparison to the historical data collected by HKCRP in this survey area. For the historical data, the encounter rates were calculated by pooling all relevant survey effort

and dolphin sightings to calculate a single index.

## 2.2. *Photo-identification Work*

- 2.2.1. When a group of Chinese White Dolphins were sighted during the line-transect survey, the survey team would end effort and approach the group slowly from the side and behind to take photographs of them. Every attempt was made to photograph every dolphin in the group, and even photograph both sides of the dolphins, since the colouration and markings on both sides may not be symmetrical.
- 2.2.2. A professional digital camera (*Canon EOS 7D Mark II* model), equipped with long telephoto lenses (100-400 mm zoom), were available on board for researchers to take sharp, close-up photographs of dolphins as they surfaced. The images were shot at the highest available resolution and stored on Compact Flash memory cards for downloading onto a computer.
- 2.2.3. All digital images taken in the field were first examined, and those containing potentially identifiable individuals were sorted out. These photographs would then be examined in greater detail, and were carefully compared to the existing Chinese White Dolphin photo-identification catalogue maintained by HKCRP since 1995. For individual dolphins that are not readily identifiable from the catalogue but have distinct features on their bodies, they will be placed in a pool of “potential new individuals”, with decision being made at the end of each year on whether any of them should be incorporated into the photo-ID catalogue.
- 2.2.4. Chinese White Dolphins can be identified by their natural markings, such as nicks, cuts, scars and deformities on their dorsal fin and body, and their unique spotting patterns were also used as secondary identifying features (Jefferson 2000).
- 2.2.5. All photographs of each individual were then compiled and arranged in chronological order, with data including the date and location first identified (initial sighting), re-sightings, associated dolphins, distinctive features, and age classes entered into a computer database.

## 3. **Monitoring Results**

### 3.1. *Vessel-based Line-transect Survey*

- 3.1.1. One set of systematic line-transect vessel survey was conducted under the present monitoring study on April 7<sup>th</sup> to cover all transect lines in SWL survey area once. The

route and track log of this survey are presented in Figure 2 and Appendix I respectively.

- 3.1.2. In addition, three line-transect surveys were also conducted under the AFCD long-term marine mammal monitoring programme in SWL survey area on April 5<sup>th</sup> (with lines no. SWL001, SWL003, SWL005 and SWL007 covered), April 11<sup>th</sup> (with lines no. SWL008 and SWL010 covered) and April 13<sup>th</sup> (with lines no. SWL002, SWL004, SWL006 and SWL008 covered). Such monitoring data were also incorporated into the present study for various analyses.
- 3.1.3. For the present study alone, a total of 70.43 km of survey effort was collected from 10:50 to 16:00 (i.e. 5 hours and 10 minutes of survey time) on April 7<sup>th</sup>, with 100% of the total survey effort being conducted under favourable weather conditions (i.e. Beaufort Sea State 3 or below with good visibility) (Appendix II). The total survey effort conducted on primary and secondary lines were 53.88 km and 16.55 km respectively.
- 3.1.4. For the combined monitoring dataset from both the present study and AFCD monitoring study, a total of 141.78 km of survey effort was collected in SWL waters in April 2017.
- 3.1.5. During this monitoring month, two groups of two Chinese White Dolphins were sighted from the survey of the present study as well as one of the three AFCD monitoring surveys respectively (Appendix III). Only one of the two dolphin groups were sighted during on-effort search, and neither of the two groups was associated with any operating fishing vessel.
- 3.1.6. Notably, eight groups of 25 finless porpoises were also sighted in SWL survey area during the surveys conducted in April, with two groups of seven porpoises sighted during the survey from the present study.
- 3.1.7. Distribution of the two sightings of two lone animals made in April 2017 is shown in Figure 3. One lone dolphin was sighted near Fan Lau, while another lone dolphin was sighted to the east of Shui Hau Peninsula (Figure 3). Besides these two sighting made in the inshore waters, the dolphins were mostly absent from the central and southern portions of the survey area during this monitoring month, where finless porpoises occurred frequently (Figure 3).
- 3.1.8. Encounter rates of Chinese White Dolphins deduced from the survey effort and on-effort sighting data made under favourable conditions (Beaufort 3 or below) in April 2017 are shown in Table 2. Comparison of encounter rates was also made to the one deduced in spring months (March-May) in the past decade (2005-14), as well as in April 2016 under

the present study (Table 2).

Table 2. Overall dolphin encounter rates (sightings per 100 km of survey effort) from the present monitoring survey and combined database with AFCD monitoring survey conducted in April 2017 (primary lines only, as well as both primary lines and secondary lines were used) in SWL survey area in comparison to the ones deduced during spring months (March-May 2005-14) in the past decade

	Encounter rate (STG) (no. of on-effort dolphin sightings per 100 km of survey effort)		Encounter rate (ANI) (no. of dolphins from all on-effort sightings per 100 km of survey effort)	
	Primary Lines Only	Both Primary and Secondary Lines	Primary Lines Only	Both Primary and Secondary Lines
<b>HYD-HZMB data (April 2017)</b>	0.0	0.0	0.0	0.0
<b>Combined data (April 2017)</b>	0.97	0.71	0.97	0.71
<b>Combined data (April 2016)</b>	0.0	0.0	0.0	0.0
<b>Historical Data (Spring 2005-14)</b>		1.54		4.14

3.1.9. From the combined data of HYD-HZMB and AFCD monitoring surveys, the overall encounter rates based on both the number of dolphin sightings (ER(STG)) and total number of dolphins (ER(ANI)) deduced in April 2017 in SWL waters were higher than the ones deduced in April 2016 (when no sighting was made) but much lower than the ones during the spring months of 2005-14 (Table 2).

3.1.10. The average group size of Chinese White Dolphins sighted during the SWL monitoring surveys in April 2017 was 1.0 animal per group (both groups consisted of single animals). This was much lower than the average group size recorded in spring months of 2005-14 (2.7).

### 3.2. Photo-identification Work

3.2.1. Attempts were made to photograph the dolphins sighted during all SWL surveys conducted in April 2017.

3.2.2. Among the two dolphins sighted during this month's surveys, two individual dolphins (WL15 and WL91) were identified and re-sighted once (Appendices IV and V). Both individuals were not accompanied by any young calves.

3.2.3. Notably, the locations where these individuals WL15 and WL91 were re-sighted were

well within their past home ranges in Southwest Lantau waters.

#### 4. References

Buckland, S. T., Anderson, D. R., Burnham, K. P., Laake, J. L., Borchers, D. L., and Thomas, L. 2001. Introduction to distance sampling: estimating abundance of biological populations. Oxford University Press, London.

Hung, S. K. 2014. Monitoring of Marine Mammals in Hong Kong waters: final report (2013-14). An unpublished report submitted to the Agriculture, Fisheries and Conservation Department, 231 pp.

Jefferson, T. A. 2000. Population biology of the Indo-Pacific hump-backed dolphin in Hong Kong waters. Wildlife Monographs 144:1-65.

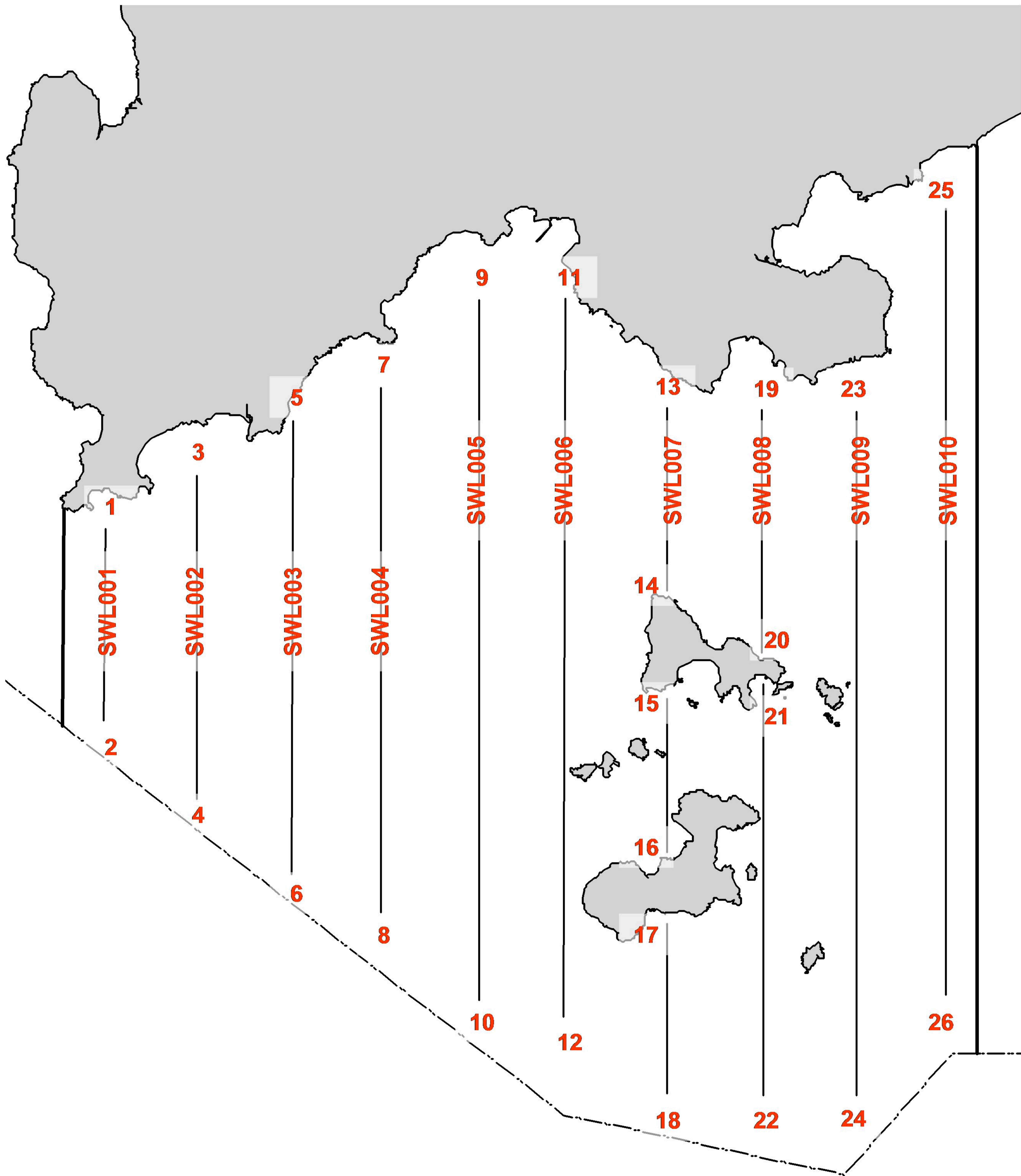


Figure 1. Survey Lines and associated coordinates in Southwest Lantau survey area



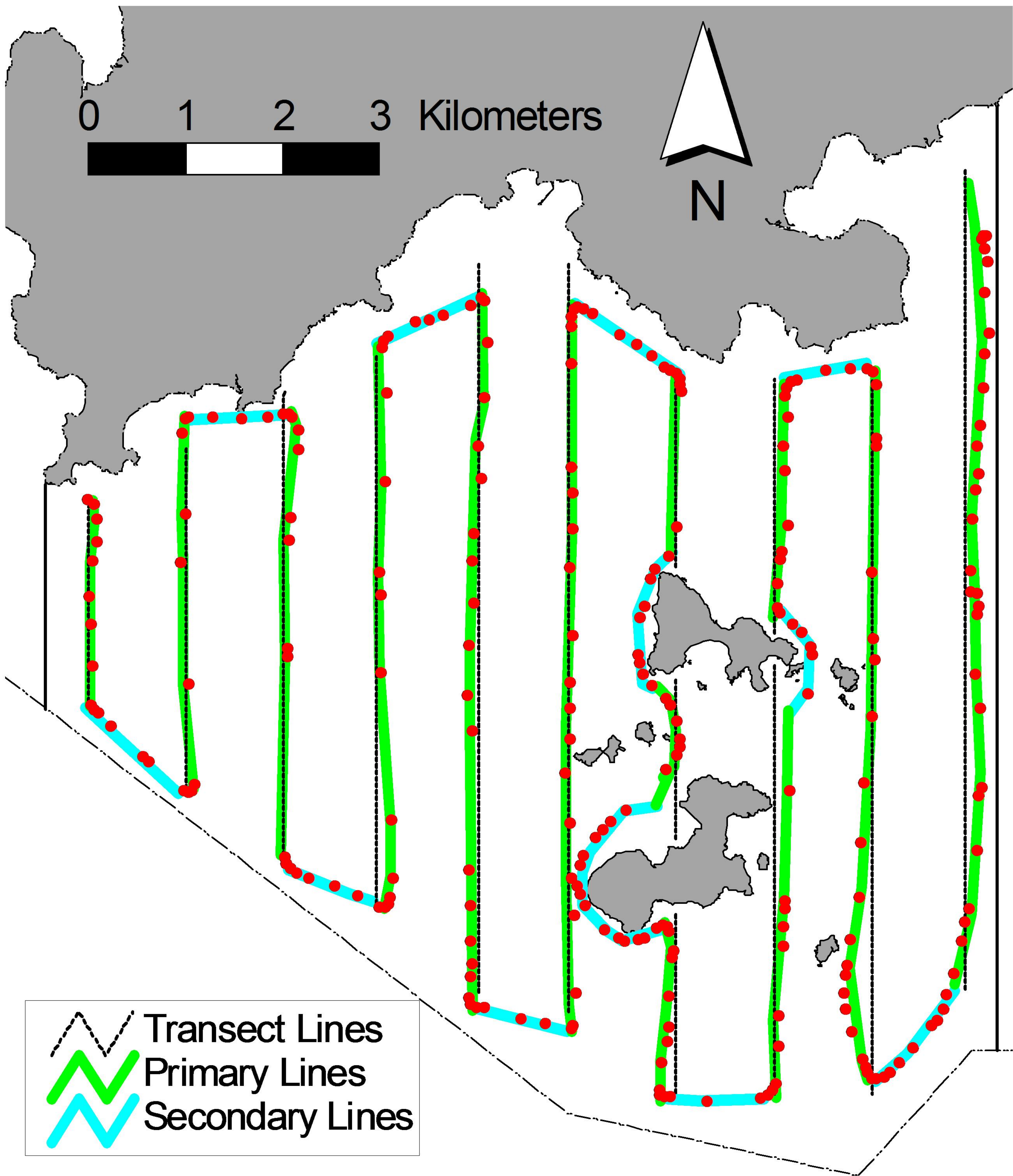


Figure 2. Survey Route on April 7<sup>th</sup>, 2017 (note: red dots represent the tracked positions of survey boat logged continuously by GPS throughout the course of the survey)

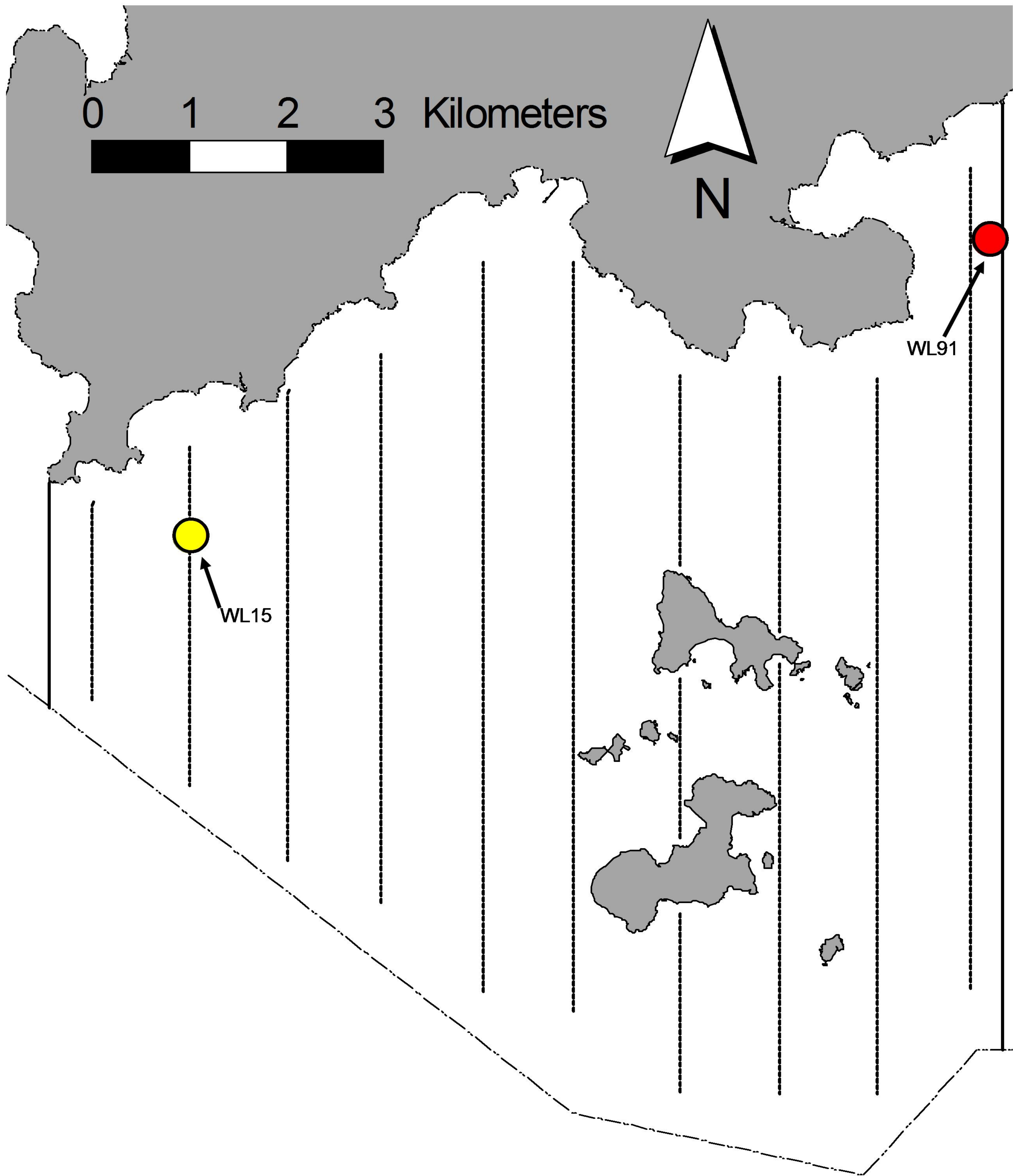


Figure 3. Distribution of Chinese White Dolphin sightings during April 2017 monitoring surveys in Southwest Lantau survey area, with identified individuals indicated for their corresponding sightings (red dot: HYD-HZMB sighting; yellow dot: AFCD sighting)

## Appendix I. Track Log of SW Lantau Survey on April 7th, 2017

Date & Time	EFFORT	Position	Leg Length	Leg Time	Leg Speed
7/4/2017 10:50	ON	N22.19416 E113.84940			
7/4/2017 10:51	ON	N22.19369 E113.84988	73 m	0:00:18	15 kph
7/4/2017 10:51	ON	N22.19298 E113.85018	85 m	0:00:20	15 kph
7/4/2017 10:51	ON	N22.19235 E113.85030	71 m	0:00:18	14 kph
7/4/2017 10:52	ON	N22.19165 E113.85022	78 m	0:00:21	13 kph
7/4/2017 10:52	ON	N22.19122 E113.85018	48 m	0:00:13	13 kph
7/4/2017 10:52	ON	N22.19052 E113.85019	78 m	0:00:20	14 kph
7/4/2017 10:53	ON	N22.18983 E113.85006	78 m	0:00:20	14 kph
7/4/2017 10:53	ON	N22.18927 E113.84990	63 m	0:00:16	14 kph
7/4/2017 10:53	ON	N22.18882 E113.84983	52 m	0:00:13	14 kph
7/4/2017 10:53	ON	N22.18805 E113.84977	86 m	0:00:21	15 kph
7/4/2017 10:54	ON	N22.18727 E113.84970	87 m	0:00:21	15 kph
7/4/2017 10:54	ON	N22.18643 E113.84956	95 m	0:00:23	15 kph
7/4/2017 10:55	ON	N22.18558 E113.84950	95 m	0:00:23	15 kph
7/4/2017 10:55	ON	N22.18494 E113.84965	72 m	0:00:18	14 kph
7/4/2017 10:55	ON	N22.18407 E113.84972	98 m	0:00:24	15 kph
7/4/2017 10:56	ON	N22.18328 E113.84970	88 m	0:00:22	14 kph
7/4/2017 10:56	ON	N22.18248 E113.84973	89 m	0:00:22	15 kph
7/4/2017 10:56	ON	N22.18169 E113.84976	88 m	0:00:22	14 kph
7/4/2017 10:57	ON	N22.18098 E113.84973	79 m	0:00:20	14 kph
7/4/2017 10:57	ON	N22.18022 E113.84974	84 m	0:00:21	14 kph
7/4/2017 10:57	ON	N22.17947 E113.84976	84 m	0:00:21	14 kph
7/4/2017 10:58	ON	N22.17887 E113.84975	68 m	0:00:17	14 kph
7/4/2017 10:58	ON	N22.17819 E113.84970	75 m	0:00:19	14 kph
7/4/2017 10:58	ON	N22.17759 E113.84967	67 m	0:00:17	14 kph
7/4/2017 10:59	ON	N22.17691 E113.84967	75 m	0:00:19	14 kph
7/4/2017 10:59	ON	N22.17620 E113.84969	79 m	0:00:20	14 kph
7/4/2017 10:59	ON	N22.17570 E113.84996	62 m	0:00:17	13 kph
7/4/2017 11:00	ON	N22.17535 E113.85051	69 m	0:00:18	14 kph
7/4/2017 11:00	ON	N22.17485 E113.85102	77 m	0:00:19	15 kph
7/4/2017 11:00	ON	N22.17430 E113.85159	85 m	0:00:20	15 kph
7/4/2017 11:00	ON	N22.17389 E113.85213	72 m	0:00:17	15 kph
7/4/2017 11:01	ON	N22.17338 E113.85269	81 m	0:00:19	15 kph
7/4/2017 11:01	ON	N22.17302 E113.85312	60 m	0:00:14	16 kph
7/4/2017 11:01	ON	N22.17266 E113.85360	63 m	0:00:15	15 kph
7/4/2017 11:02	ON	N22.17212 E113.85425	90 m	0:00:21	15 kph
7/4/2017 11:02	ON	N22.17158 E113.85484	85 m	0:00:20	15 kph
7/4/2017 11:02	ON	N22.17116 E113.85537	72 m	0:00:17	15 kph
7/4/2017 11:02	ON	N22.17083 E113.85582	59 m	0:00:14	15 kph
7/4/2017 11:03	ON	N22.17046 E113.85635	69 m	0:00:16	15 kph
7/4/2017 11:03	ON	N22.16999 E113.85702	86 m	0:00:20	15 kph
7/4/2017 11:03	ON	N22.16948 E113.85776	95 m	0:00:22	16 kph
7/4/2017 11:04	ON	N22.16905 E113.85835	77 m	0:00:18	15 kph
7/4/2017 11:04	ON	N22.16863 E113.85890	74 m	0:00:17	16 kph
7/4/2017 11:04	ON	N22.16847 E113.85944	59 m	0:00:15	14 kph
7/4/2017 11:04	ON	N22.16873 E113.85982	49 m	0:00:14	13 kph
7/4/2017 11:05	ON	N22.16923 E113.86001	59 m	0:00:16	13 kph
7/4/2017 11:05	ON	N22.16980 E113.86000	63 m	0:00:17	13 kph
7/4/2017 11:05	ON	N22.17057 E113.85995	86 m	0:00:23	14 kph
7/4/2017 11:06	ON	N22.17112 E113.85992	61 m	0:00:16	14 kph
7/4/2017 11:06	ON	N22.17180 E113.85987	76 m	0:00:20	14 kph
7/4/2017 11:06	ON	N22.17248 E113.85979	76 m	0:00:20	14 kph
7/4/2017 11:07	ON	N22.17341 E113.85973	104 m	0:00:27	14 kph
7/4/2017 11:07	ON	N22.17427 E113.85965	96 m	0:00:25	14 kph
7/4/2017 11:08	ON	N22.17510 E113.85960	92 m	0:00:24	14 kph
7/4/2017 11:08	ON	N22.17582 E113.85955	81 m	0:00:21	14 kph
7/4/2017 11:08	ON	N22.17667 E113.85953	94 m	0:00:24	14 kph
7/4/2017 11:09	ON	N22.17719 E113.85949	58 m	0:00:15	14 kph
7/4/2017 11:09	ON	N22.17795 E113.85937	85 m	0:00:22	14 kph
7/4/2017 11:09	ON	N22.17860 E113.85931	73 m	0:00:19	14 kph
7/4/2017 11:10	ON	N22.17918 E113.85926	65 m	0:00:17	14 kph
7/4/2017 11:10	ON	N22.17993 E113.85919	84 m	0:00:22	14 kph
7/4/2017 11:10	ON	N22.18052 E113.85917	66 m	0:00:17	14 kph
7/4/2017 11:11	ON	N22.18115 E113.85915	70 m	0:00:18	14 kph

## Appendix I. (cont'd)

Date & Time	EFFORT	Position	Leg Length	Leg Time	Leg Speed
7/4/2017 11:11	ON	N22.18194 E113.85914	87 m	0:00:22	14 kph
7/4/2017 11:11	ON	N22.18263 E113.85911	77 m	0:00:20	14 kph
7/4/2017 11:11	ON	N22.18312 E113.85910	55 m	0:00:14	14 kph
7/4/2017 11:12	ON	N22.18350 E113.85908	42 m	0:00:11	14 kph
7/4/2017 11:12	ON	N22.18392 E113.85905	47 m	0:00:12	14 kph
7/4/2017 11:12	ON	N22.18448 E113.85901	63 m	0:00:16	14 kph
7/4/2017 11:12	ON	N22.18510 E113.85893	69 m	0:00:18	14 kph
7/4/2017 11:13	ON	N22.18577 E113.85886	75 m	0:00:19	14 kph
7/4/2017 11:13	ON	N22.18650 E113.85882	81 m	0:00:20	15 kph
7/4/2017 11:13	ON	N22.18712 E113.85881	69 m	0:00:17	15 kph
7/4/2017 11:14	ON	N22.18786 E113.85873	84 m	0:00:21	14 kph
7/4/2017 11:14	ON	N22.18862 E113.85864	85 m	0:00:21	14 kph
7/4/2017 11:14	ON	N22.18923 E113.85872	69 m	0:00:17	15 kph
7/4/2017 11:15	ON	N22.18991 E113.85877	75 m	0:00:18	15 kph
7/4/2017 11:15	ON	N22.19069 E113.85881	88 m	0:00:21	15 kph
7/4/2017 11:15	ON	N22.19143 E113.85883	82 m	0:00:20	15 kph
7/4/2017 11:16	ON	N22.19222 E113.85892	88 m	0:00:21	15 kph
7/4/2017 11:16	ON	N22.19288 E113.85895	73 m	0:00:18	15 kph
7/4/2017 11:16	ON	N22.19358 E113.85892	79 m	0:00:19	15 kph
7/4/2017 11:17	ON	N22.19423 E113.85890	72 m	0:00:18	14 kph
7/4/2017 11:17	ON	N22.19504 E113.85889	90 m	0:00:22	15 kph
7/4/2017 11:17	ON	N22.19582 E113.85888	87 m	0:00:21	15 kph
7/4/2017 11:18	ON	N22.19649 E113.85887	74 m	0:00:19	14 kph
7/4/2017 11:18	ON	N22.19720 E113.85884	79 m	0:00:20	14 kph
7/4/2017 11:18	ON	N22.19808 E113.85878	98 m	0:00:25	14 kph
7/4/2017 11:19	ON	N22.19873 E113.85871	73 m	0:00:19	14 kph
7/4/2017 11:19	ON	N22.19943 E113.85870	78 m	0:00:20	14 kph
7/4/2017 11:19	ON	N22.20002 E113.85870	66 m	0:00:17	14 kph
7/4/2017 11:20	ON	N22.20065 E113.85874	70 m	0:00:18	14 kph
7/4/2017 11:20	ON	N22.20120 E113.85895	65 m	0:00:18	13 kph
7/4/2017 11:20	ON	N22.20143 E113.85936	50 m	0:00:15	12 kph
7/4/2017 11:20	ON	N22.20150 E113.85996	62 m	0:00:17	13 kph
7/4/2017 11:21	ON	N22.20147 E113.86088	95 m	0:00:25	14 kph
7/4/2017 11:21	ON	N22.20144 E113.86177	92 m	0:00:24	14 kph
7/4/2017 11:22	ON	N22.20139 E113.86240	65 m	0:00:17	14 kph
7/4/2017 11:22	ON	N22.20130 E113.86311	75 m	0:00:19	14 kph
7/4/2017 11:22	ON	N22.20120 E113.86395	87 m	0:00:22	14 kph
7/4/2017 11:23	ON	N22.20115 E113.86466	73 m	0:00:18	15 kph
7/4/2017 11:23	ON	N22.20118 E113.86542	78 m	0:00:19	15 kph
7/4/2017 11:23	ON	N22.20128 E113.86638	100 m	0:00:24	15 kph
7/4/2017 11:24	ON	N22.20137 E113.86722	88 m	0:00:21	15 kph
7/4/2017 11:24	ON	N22.20150 E113.86800	81 m	0:00:19	15 kph
7/4/2017 11:24	ON	N22.20172 E113.86881	87 m	0:00:20	16 kph
7/4/2017 11:24	ON	N22.20172 E113.86935	56 m	0:00:14	14 kph
7/4/2017 11:25	ON	N22.20137 E113.86974	56 m	0:00:16	13 kph
7/4/2017 11:25	ON	N22.20083 E113.87002	67 m	0:00:18	13 kph
7/4/2017 11:25	ON	N22.20032 E113.87025	61 m	0:00:16	14 kph
7/4/2017 11:26	ON	N22.19972 E113.87026	66 m	0:00:18	13 kph
7/4/2017 11:26	ON	N22.19919 E113.87024	59 m	0:00:16	13 kph
7/4/2017 11:26	ON	N22.19862 E113.87027	64 m	0:00:17	13 kph
7/4/2017 11:26	ON	N22.19803 E113.87017	67 m	0:00:18	13 kph
7/4/2017 11:27	ON	N22.19739 E113.87013	71 m	0:00:19	13 kph
7/4/2017 11:27	ON	N22.19678 E113.87005	69 m	0:00:19	13 kph
7/4/2017 11:27	ON	N22.19610 E113.86993	76 m	0:00:21	13 kph
7/4/2017 11:28	ON	N22.19535 E113.86988	83 m	0:00:23	13 kph
7/4/2017 11:28	ON	N22.19462 E113.86991	82 m	0:00:22	13 kph
7/4/2017 11:29	ON	N22.19383 E113.86985	88 m	0:00:24	13 kph
7/4/2017 11:29	ON	N22.19316 E113.86980	75 m	0:00:20	13 kph
7/4/2017 11:29	ON	N22.19256 E113.86964	69 m	0:00:19	13 kph
7/4/2017 11:30	ON	N22.19200 E113.86955	63 m	0:00:17	13 kph
7/4/2017 11:30	ON	N22.19132 E113.86954	76 m	0:00:20	14 kph
7/4/2017 11:30	ON	N22.19066 E113.86943	75 m	0:00:20	13 kph
7/4/2017 11:31	ON	N22.18997 E113.86940	76 m	0:00:20	14 kph
7/4/2017 11:31	ON	N22.18935 E113.86941	70 m	0:00:18	14 kph

## Appendix I. (cont'd)

Date & Time	EFFORT	Position	Leg Length	Leg Time	Leg Speed
7/4/2017 11:31	ON	N22.18877 E113.86939	65 m	0:00:17	14 kph
7/4/2017 11:31	ON	N22.18797 E113.86940	89 m	0:00:23	14 kph
7/4/2017 11:32	ON	N22.18737 E113.86941	67 m	0:00:17	14 kph
7/4/2017 11:32	ON	N22.18678 E113.86938	66 m	0:00:17	14 kph
7/4/2017 11:32	ON	N22.18604 E113.86939	83 m	0:00:21	14 kph
7/4/2017 11:33	ON	N22.18548 E113.86938	62 m	0:00:16	14 kph
7/4/2017 11:33	ON	N22.18502 E113.86939	51 m	0:00:13	14 kph
7/4/2017 11:33	ON	N22.18442 E113.86941	67 m	0:00:17	14 kph
7/4/2017 11:33	ON	N22.18387 E113.86934	62 m	0:00:16	14 kph
7/4/2017 11:34	ON	N22.18317 E113.86926	77 m	0:00:20	14 kph
7/4/2017 11:34	ON	N22.18254 E113.86924	71 m	0:00:18	14 kph
7/4/2017 11:34	ON	N22.18176 E113.86926	87 m	0:00:22	14 kph
7/4/2017 11:35	ON	N22.18108 E113.86926	75 m	0:00:19	14 kph
7/4/2017 11:35	ON	N22.18044 E113.86927	71 m	0:00:18	14 kph
7/4/2017 11:35	ON	N22.17973 E113.86925	79 m	0:00:20	14 kph
7/4/2017 11:36	ON	N22.17895 E113.86923	88 m	0:00:22	14 kph
7/4/2017 11:36	ON	N22.17826 E113.86922	77 m	0:00:19	15 kph
7/4/2017 11:36	ON	N22.17765 E113.86922	68 m	0:00:17	14 kph
7/4/2017 11:37	ON	N22.17693 E113.86921	80 m	0:00:20	14 kph
7/4/2017 11:37	ON	N22.17631 E113.86920	69 m	0:00:17	15 kph
7/4/2017 11:37	ON	N22.17566 E113.86919	73 m	0:00:18	15 kph
7/4/2017 11:38	ON	N22.17504 E113.86920	69 m	0:00:17	15 kph
7/4/2017 11:38	ON	N22.17428 E113.86921	85 m	0:00:21	15 kph
7/4/2017 11:38	ON	N22.17341 E113.86914	96 m	0:00:24	14 kph
7/4/2017 11:39	ON	N22.17268 E113.86911	81 m	0:00:20	15 kph
7/4/2017 11:39	ON	N22.17193 E113.86909	84 m	0:00:21	14 kph
7/4/2017 11:39	ON	N22.17116 E113.86909	85 m	0:00:21	15 kph
7/4/2017 11:40	ON	N22.17054 E113.86911	69 m	0:00:17	15 kph
7/4/2017 11:40	ON	N22.16982 E113.86914	81 m	0:00:20	15 kph
7/4/2017 11:40	ON	N22.16913 E113.86912	76 m	0:00:19	14 kph
7/4/2017 11:41	ON	N22.16849 E113.86911	72 m	0:00:18	14 kph
7/4/2017 11:41	ON	N22.16772 E113.86912	85 m	0:00:21	15 kph
7/4/2017 11:41	ON	N22.16710 E113.86911	69 m	0:00:17	15 kph
7/4/2017 11:42	ON	N22.16645 E113.86909	73 m	0:00:18	15 kph
7/4/2017 11:42	ON	N22.16576 E113.86906	77 m	0:00:19	15 kph
7/4/2017 11:42	ON	N22.16515 E113.86903	68 m	0:00:17	14 kph
7/4/2017 11:42	ON	N22.16446 E113.86899	77 m	0:00:19	15 kph
7/4/2017 11:43	ON	N22.16362 E113.86898	93 m	0:00:23	14 kph
7/4/2017 11:43	ON	N22.16290 E113.86900	81 m	0:00:20	15 kph
7/4/2017 11:43	ON	N22.16234 E113.86914	64 m	0:00:16	14 kph
7/4/2017 11:44	ON	N22.16187 E113.86957	69 m	0:00:17	15 kph
7/4/2017 11:44	ON	N22.16152 E113.87016	71 m	0:00:17	15 kph
7/4/2017 11:44	ON	N22.16127 E113.87080	72 m	0:00:17	15 kph
7/4/2017 11:45	ON	N22.16103 E113.87154	81 m	0:00:19	15 kph
7/4/2017 11:45	ON	N22.16081 E113.87224	76 m	0:00:18	15 kph
7/4/2017 11:45	ON	N22.16061 E113.87304	85 m	0:00:20	15 kph
7/4/2017 11:46	ON	N22.16034 E113.87397	102 m	0:00:24	15 kph
7/4/2017 11:46	ON	N22.16005 E113.87474	85 m	0:00:20	15 kph
7/4/2017 11:46	ON	N22.15973 E113.87553	89 m	0:00:21	15 kph
7/4/2017 11:47	ON	N22.15945 E113.87625	81 m	0:00:19	15 kph
7/4/2017 11:47	ON	N22.15917 E113.87697	81 m	0:00:19	15 kph
7/4/2017 11:47	ON	N22.15887 E113.87769	81 m	0:00:19	15 kph
7/4/2017 11:48	ON	N22.15850 E113.87844	88 m	0:00:21	15 kph
7/4/2017 11:48	ON	N22.15850 E113.87904	62 m	0:00:16	14 kph
7/4/2017 11:48	ON	N22.15881 E113.87939	50 m	0:00:14	13 kph
7/4/2017 11:48	ON	N22.15935 E113.87959	62 m	0:00:17	13 kph
7/4/2017 11:49	ON	N22.15994 E113.87966	66 m	0:00:18	13 kph
7/4/2017 11:49	ON	N22.16051 E113.87977	64 m	0:00:18	13 kph
7/4/2017 11:49	ON	N22.16105 E113.87988	62 m	0:00:17	13 kph
7/4/2017 11:50	ON	N22.16171 E113.87992	74 m	0:00:20	13 kph
7/4/2017 11:50	ON	N22.16233 E113.87988	68 m	0:00:19	13 kph
7/4/2017 11:50	ON	N22.16302 E113.87987	77 m	0:00:21	13 kph
7/4/2017 11:51	ON	N22.16370 E113.87982	76 m	0:00:21	13 kph
7/4/2017 11:51	ON	N22.16435 E113.87978	73 m	0:00:20	13 kph

## Appendix I. (cont'd)

Date & Time	EFFORT	Position	Leg Length	Leg Time	Leg Speed
7/4/2017 11:51	ON	N22.16484 E113.87973	54 m	0:00:15	13 kph
7/4/2017 11:51	ON	N22.16542 E113.87970	65 m	0:00:18	13 kph
7/4/2017 11:52	ON	N22.16614 E113.87966	79 m	0:00:22	13 kph
7/4/2017 11:52	ON	N22.16672 E113.87963	65 m	0:00:18	13 kph
7/4/2017 11:52	ON	N22.16733 E113.87961	69 m	0:00:19	13 kph
7/4/2017 11:53	ON	N22.16791 E113.87957	65 m	0:00:18	13 kph
7/4/2017 11:53	ON	N22.16851 E113.87952	67 m	0:00:19	13 kph
7/4/2017 11:53	ON	N22.16906 E113.87946	61 m	0:00:17	13 kph
7/4/2017 11:54	ON	N22.16954 E113.87940	54 m	0:00:15	13 kph
7/4/2017 11:54	ON	N22.17037 E113.87929	93 m	0:00:26	13 kph
7/4/2017 11:54	ON	N22.17105 E113.87919	76 m	0:00:21	13 kph
7/4/2017 11:55	ON	N22.17170 E113.87914	72 m	0:00:20	13 kph
7/4/2017 11:55	ON	N22.17228 E113.87914	65 m	0:00:18	13 kph
7/4/2017 11:55	ON	N22.17286 E113.87914	65 m	0:00:18	13 kph
7/4/2017 11:56	ON	N22.17357 E113.87907	78 m	0:00:22	13 kph
7/4/2017 11:56	ON	N22.17424 E113.87902	75 m	0:00:21	13 kph
7/4/2017 11:56	ON	N22.17482 E113.87897	65 m	0:00:18	13 kph
7/4/2017 11:57	ON	N22.17543 E113.87889	68 m	0:00:19	13 kph
7/4/2017 11:57	ON	N22.17601 E113.87883	64 m	0:00:18	13 kph
7/4/2017 11:57	ON	N22.17665 E113.87877	72 m	0:00:20	13 kph
7/4/2017 11:58	ON	N22.17737 E113.87873	80 m	0:00:22	13 kph
7/4/2017 11:58	ON	N22.17793 E113.87871	62 m	0:00:17	13 kph
7/4/2017 11:58	ON	N22.17854 E113.87865	69 m	0:00:19	13 kph
7/4/2017 11:59	ON	N22.17907 E113.87861	58 m	0:00:16	13 kph
7/4/2017 11:59	ON	N22.17953 E113.87860	52 m	0:00:14	13 kph
7/4/2017 11:59	ON	N22.18009 E113.87861	62 m	0:00:17	13 kph
7/4/2017 11:59	ON	N22.18076 E113.87862	74 m	0:00:20	13 kph
7/4/2017 12:00	ON	N22.18135 E113.87859	66 m	0:00:18	13 kph
7/4/2017 12:00	ON	N22.18188 E113.87859	58 m	0:00:16	13 kph
7/4/2017 12:00	ON	N22.18241 E113.87860	60 m	0:00:16	13 kph
7/4/2017 12:01	ON	N22.18298 E113.87859	63 m	0:00:17	13 kph
7/4/2017 12:01	ON	N22.18372 E113.87855	82 m	0:00:22	13 kph
7/4/2017 12:01	ON	N22.18442 E113.87855	79 m	0:00:21	14 kph
7/4/2017 12:02	ON	N22.18517 E113.87860	83 m	0:00:22	14 kph
7/4/2017 12:02	ON	N22.18588 E113.87862	79 m	0:00:21	14 kph
7/4/2017 12:02	ON	N22.18659 E113.87858	79 m	0:00:21	14 kph
7/4/2017 12:03	ON	N22.18716 E113.87848	64 m	0:00:17	14 kph
7/4/2017 12:03	ON	N22.18780 E113.87840	72 m	0:00:19	14 kph
7/4/2017 12:03	ON	N22.18846 E113.87839	73 m	0:00:19	14 kph
7/4/2017 12:04	ON	N22.18908 E113.87841	68 m	0:00:18	14 kph
7/4/2017 12:04	ON	N22.18977 E113.87847	77 m	0:00:20	14 kph
7/4/2017 12:04	ON	N22.19060 E113.87860	94 m	0:00:24	14 kph
7/4/2017 12:05	ON	N22.19138 E113.87870	87 m	0:00:22	14 kph
7/4/2017 12:05	ON	N22.19215 E113.87877	85 m	0:00:22	14 kph
7/4/2017 12:05	ON	N22.19299 E113.87880	94 m	0:00:24	14 kph
7/4/2017 12:06	ON	N22.19388 E113.87882	98 m	0:00:25	14 kph
7/4/2017 12:06	ON	N22.19433 E113.87886	51 m	0:00:13	14 kph
7/4/2017 12:06	ON	N22.19508 E113.87890	83 m	0:00:21	14 kph
7/4/2017 12:07	ON	N22.19572 E113.87897	72 m	0:00:18	14 kph
7/4/2017 12:07	ON	N22.19637 E113.87905	73 m	0:00:18	15 kph
7/4/2017 12:07	ON	N22.19714 E113.87902	86 m	0:00:22	14 kph
7/4/2017 12:08	ON	N22.19775 E113.87901	67 m	0:00:17	14 kph
7/4/2017 12:08	ON	N22.19852 E113.87900	86 m	0:00:22	14 kph
7/4/2017 12:08	ON	N22.19916 E113.87898	71 m	0:00:18	14 kph
7/4/2017 12:09	ON	N22.19990 E113.87897	82 m	0:00:20	15 kph
7/4/2017 12:09	ON	N22.20058 E113.87904	76 m	0:00:19	14 kph
7/4/2017 12:09	ON	N22.20124 E113.87906	73 m	0:00:18	15 kph
7/4/2017 12:10	ON	N22.20194 E113.87911	78 m	0:00:19	15 kph
7/4/2017 12:10	ON	N22.20270 E113.87913	85 m	0:00:21	15 kph
7/4/2017 12:10	ON	N22.20349 E113.87907	89 m	0:00:22	14 kph
7/4/2017 12:11	ON	N22.20427 E113.87895	88 m	0:00:22	14 kph
7/4/2017 12:11	ON	N22.20508 E113.87879	92 m	0:00:23	14 kph
7/4/2017 12:11	ON	N22.20591 E113.87868	93 m	0:00:23	15 kph
7/4/2017 12:12	ON	N22.20668 E113.87864	86 m	0:00:21	15 kph

## Appendix I. (cont'd)

Date & Time	EFFORT	Position	Leg Length	Leg Time	Leg Speed
7/4/2017 12:12	ON	N22.20751 E113.87855	93 m	0:00:23	15 kph
7/4/2017 12:12	ON	N22.20807 E113.87876	66 m	0:00:17	14 kph
7/4/2017 12:13	ON	N22.20854 E113.87933	79 m	0:00:20	14 kph
7/4/2017 12:13	ON	N22.20875 E113.87979	53 m	0:00:13	15 kph
7/4/2017 12:13	ON	N22.20895 E113.88031	58 m	0:00:14	15 kph
7/4/2017 12:13	ON	N22.20912 E113.88074	49 m	0:00:12	15 kph
7/4/2017 12:14	ON	N22.20942 E113.88124	61 m	0:00:15	15 kph
7/4/2017 12:14	ON	N22.20976 E113.88195	83 m	0:00:20	15 kph
7/4/2017 12:14	ON	N22.20983 E113.88265	73 m	0:00:18	15 kph
7/4/2017 12:15	ON	N22.20992 E113.88329	66 m	0:00:16	15 kph
7/4/2017 12:15	ON	N22.21012 E113.88393	70 m	0:00:17	15 kph
7/4/2017 12:15	ON	N22.21044 E113.88470	86 m	0:00:21	15 kph
7/4/2017 12:16	ON	N22.21074 E113.88553	92 m	0:00:22	15 kph
7/4/2017 12:16	ON	N22.21092 E113.88619	71 m	0:00:17	15 kph
7/4/2017 12:16	ON	N22.21103 E113.88682	66 m	0:00:16	15 kph
7/4/2017 12:16	ON	N22.21120 E113.88752	74 m	0:00:18	15 kph
7/4/2017 12:17	ON	N22.21160 E113.88802	68 m	0:00:17	14 kph
7/4/2017 12:17	ON	N22.21191 E113.88850	61 m	0:00:16	14 kph
7/4/2017 12:17	ON	N22.21173 E113.88894	49 m	0:00:15	12 kph
7/4/2017 12:17	ON	N22.21125 E113.88901	54 m	0:00:17	11 kph
7/4/2017 12:18	ON	N22.21055 E113.88903	78 m	0:00:22	13 kph
7/4/2017 12:18	ON	N22.20993 E113.88905	69 m	0:00:19	13 kph
7/4/2017 12:18	ON	N22.20929 E113.88908	71 m	0:00:19	13 kph
7/4/2017 12:19	ON	N22.20856 E113.88907	81 m	0:00:22	13 kph
7/4/2017 12:19	ON	N22.20789 E113.88907	74 m	0:00:20	13 kph
7/4/2017 12:20	ON	N22.20719 E113.88904	78 m	0:00:21	13 kph
7/4/2017 12:20	ON	N22.20647 E113.88895	81 m	0:00:22	13 kph
7/4/2017 12:20	ON	N22.20579 E113.88888	76 m	0:00:21	13 kph
7/4/2017 12:21	ON	N22.20526 E113.88885	59 m	0:00:16	13 kph
7/4/2017 12:21	ON	N22.20455 E113.88886	79 m	0:00:21	14 kph
7/4/2017 12:21	ON	N22.20384 E113.88880	79 m	0:00:21	13 kph
7/4/2017 12:22	ON	N22.20323 E113.88880	68 m	0:00:18	14 kph
7/4/2017 12:22	ON	N22.20260 E113.88873	71 m	0:00:19	13 kph
7/4/2017 12:22	ON	N22.20197 E113.88866	71 m	0:00:19	13 kph
7/4/2017 12:22	ON	N22.20133 E113.88858	71 m	0:00:19	13 kph
7/4/2017 12:23	ON	N22.20064 E113.88850	78 m	0:00:21	13 kph
7/4/2017 12:23	ON	N22.20003 E113.88846	67 m	0:00:18	13 kph
7/4/2017 12:23	ON	N22.19945 E113.88833	67 m	0:00:18	13 kph
7/4/2017 12:24	ON	N22.19887 E113.88823	65 m	0:00:18	13 kph
7/4/2017 12:24	ON	N22.19820 E113.88839	77 m	0:00:20	14 kph
7/4/2017 12:24	ON	N22.19766 E113.88846	60 m	0:00:16	14 kph
7/4/2017 12:25	ON	N22.19711 E113.88849	62 m	0:00:16	14 kph
7/4/2017 12:25	ON	N22.19650 E113.88855	68 m	0:00:17	14 kph
7/4/2017 12:25	ON	N22.19599 E113.88862	58 m	0:00:15	14 kph
7/4/2017 12:25	ON	N22.19531 E113.88856	75 m	0:00:20	14 kph
7/4/2017 12:26	ON	N22.19476 E113.88845	63 m	0:00:17	13 kph
7/4/2017 12:26	ON	N22.19415 E113.88838	69 m	0:00:18	14 kph
7/4/2017 12:26	ON	N22.19340 E113.88825	84 m	0:00:22	14 kph
7/4/2017 12:27	ON	N22.19283 E113.88814	65 m	0:00:17	14 kph
7/4/2017 12:27	ON	N22.19209 E113.88803	83 m	0:00:22	14 kph
7/4/2017 12:27	ON	N22.19129 E113.88787	91 m	0:00:24	14 kph
7/4/2017 12:28	ON	N22.19051 E113.88782	87 m	0:00:23	14 kph
7/4/2017 12:28	ON	N22.18975 E113.88775	85 m	0:00:22	14 kph
7/4/2017 12:29	ON	N22.18887 E113.88769	98 m	0:00:26	14 kph
7/4/2017 12:29	ON	N22.18817 E113.88773	78 m	0:00:20	14 kph
7/4/2017 12:29	ON	N22.18734 E113.88772	93 m	0:00:24	14 kph
7/4/2017 12:30	ON	N22.18667 E113.88779	75 m	0:00:19	14 kph
7/4/2017 12:30	ON	N22.18600 E113.88779	74 m	0:00:19	14 kph
7/4/2017 12:30	ON	N22.18522 E113.88780	87 m	0:00:22	14 kph
7/4/2017 12:31	ON	N22.18455 E113.88776	74 m	0:00:19	14 kph
7/4/2017 12:31	ON	N22.18378 E113.88768	87 m	0:00:22	14 kph
7/4/2017 12:31	ON	N22.18303 E113.88764	83 m	0:00:21	14 kph
7/4/2017 12:32	ON	N22.18230 E113.88753	82 m	0:00:21	14 kph
7/4/2017 12:32	ON	N22.18148 E113.88740	92 m	0:00:23	14 kph

## Appendix I. (cont'd)

Date & Time	EFFORT	Position	Leg Length	Leg Time	Leg Speed
7/4/2017 12:32	ON	N22.18080 E113.88737	76 m	0:00:19	14 kph
7/4/2017 12:33	ON	N22.17998 E113.88734	92 m	0:00:23	14 kph
7/4/2017 12:33	ON	N22.17937 E113.88729	68 m	0:00:17	14 kph
7/4/2017 12:33	ON	N22.17861 E113.88729	84 m	0:00:21	14 kph
7/4/2017 12:34	ON	N22.17774 E113.88726	97 m	0:00:24	15 kph
7/4/2017 12:34	ON	N22.17709 E113.88728	73 m	0:00:18	15 kph
7/4/2017 12:35	ON	N22.17625 E113.88734	94 m	0:00:23	15 kph
7/4/2017 12:35	ON	N22.17548 E113.88741	86 m	0:00:21	15 kph
7/4/2017 12:35	ON	N22.17467 E113.88752	91 m	0:00:22	15 kph
7/4/2017 12:36	ON	N22.17386 E113.88766	91 m	0:00:22	15 kph
7/4/2017 12:36	ON	N22.17302 E113.88763	94 m	0:00:23	15 kph
7/4/2017 12:36	ON	N22.17221 E113.88766	90 m	0:00:22	15 kph
7/4/2017 12:37	ON	N22.17132 E113.88763	99 m	0:00:24	15 kph
7/4/2017 12:37	ON	N22.17070 E113.88762	68 m	0:00:17	14 kph
7/4/2017 12:37	ON	N22.16986 E113.88760	94 m	0:00:23	15 kph
7/4/2017 12:38	ON	N22.16909 E113.88758	86 m	0:00:21	15 kph
7/4/2017 12:38	ON	N22.16824 E113.88759	94 m	0:00:23	15 kph
7/4/2017 12:39	ON	N22.16741 E113.88755	93 m	0:00:23	15 kph
7/4/2017 12:39	ON	N22.16667 E113.88755	83 m	0:00:20	15 kph
7/4/2017 12:39	ON	N22.16586 E113.88755	90 m	0:00:22	15 kph
7/4/2017 12:40	ON	N22.16505 E113.88751	90 m	0:00:22	15 kph
7/4/2017 12:40	ON	N22.16413 E113.88756	102 m	0:00:25	15 kph
7/4/2017 12:40	ON	N22.16322 E113.88750	102 m	0:00:25	15 kph
7/4/2017 12:41	ON	N22.16245 E113.88748	85 m	0:00:21	15 kph
7/4/2017 12:41	ON	N22.16173 E113.88745	81 m	0:00:20	15 kph
7/4/2017 12:41	ON	N22.16107 E113.88753	73 m	0:00:18	15 kph
7/4/2017 12:42	ON	N22.16038 E113.88755	77 m	0:00:19	15 kph
7/4/2017 12:42	ON	N22.15957 E113.88758	90 m	0:00:22	15 kph
7/4/2017 12:43	ON	N22.15866 E113.88762	102 m	0:00:25	15 kph
7/4/2017 12:43	ON	N22.15804 E113.88761	68 m	0:00:17	14 kph
7/4/2017 12:43	ON	N22.15727 E113.88760	86 m	0:00:21	15 kph
7/4/2017 12:43	ON	N22.15660 E113.88755	75 m	0:00:18	15 kph
7/4/2017 12:44	ON	N22.15617 E113.88752	48 m	0:00:12	14 kph
7/4/2017 12:44	ON	N22.15550 E113.88759	75 m	0:00:18	15 kph
7/4/2017 12:44	ON	N22.15484 E113.88769	75 m	0:00:18	15 kph
7/4/2017 12:45	ON	N22.15424 E113.88774	66 m	0:00:16	15 kph
7/4/2017 12:45	ON	N22.15354 E113.88775	79 m	0:00:19	15 kph
7/4/2017 12:45	ON	N22.15301 E113.88770	59 m	0:00:14	15 kph
7/4/2017 12:45	ON	N22.15242 E113.88759	67 m	0:00:16	15 kph
7/4/2017 12:46	ON	N22.15184 E113.88746	66 m	0:00:16	15 kph
7/4/2017 12:46	ON	N22.15133 E113.88736	57 m	0:00:14	15 kph
7/4/2017 12:46	ON	N22.15062 E113.88735	79 m	0:00:19	15 kph
7/4/2017 12:46	ON	N22.15002 E113.88759	72 m	0:00:18	14 kph
7/4/2017 12:47	ON	N22.14973 E113.88822	72 m	0:00:18	14 kph
7/4/2017 12:47	ON	N22.14968 E113.88899	79 m	0:00:19	15 kph
7/4/2017 12:47	ON	N22.14959 E113.88948	52 m	0:00:12	15 kph
7/4/2017 12:48	ON	N22.14944 E113.89004	60 m	0:00:14	15 kph
7/4/2017 12:48	ON	N22.14928 E113.89055	55 m	0:00:13	15 kph
7/4/2017 12:48	ON	N22.14906 E113.89126	77 m	0:00:18	15 kph
7/4/2017 12:48	ON	N22.14888 E113.89192	72 m	0:00:17	15 kph
7/4/2017 12:49	ON	N22.14871 E113.89263	76 m	0:00:18	15 kph
7/4/2017 12:49	ON	N22.14856 E113.89334	75 m	0:00:18	15 kph
7/4/2017 12:49	ON	N22.14847 E113.89383	51 m	0:00:12	15 kph
7/4/2017 12:49	ON	N22.14835 E113.89437	58 m	0:00:14	15 kph
7/4/2017 12:50	ON	N22.14829 E113.89495	60 m	0:00:15	14 kph
7/4/2017 12:50	ON	N22.14822 E113.89569	77 m	0:00:19	14 kph
7/4/2017 12:50	ON	N22.14806 E113.89638	73 m	0:00:18	15 kph
7/4/2017 12:50	ON	N22.14793 E113.89691	57 m	0:00:14	15 kph
7/4/2017 12:51	ON	N22.14790 E113.89758	68 m	0:00:18	14 kph
7/4/2017 12:51	ON	N22.14823 E113.89783	45 m	0:00:14	12 kph
7/4/2017 12:51	ON	N22.14876 E113.89793	59 m	0:00:17	13 kph
7/4/2017 12:52	ON	N22.14938 E113.89797	69 m	0:00:19	13 kph
7/4/2017 12:52	ON	N22.15000 E113.89795	69 m	0:00:19	13 kph
7/4/2017 12:52	ON	N22.15051 E113.89804	58 m	0:00:16	13 kph



## Appendix I. (cont'd)

Date & Time	EFFORT	Position	Leg Length	Leg Time	Leg Speed
7/4/2017 12:52	ON	N22.15099 E113.89814	54 m	0:00:15	13 kph
7/4/2017 12:53	ON	N22.15159 E113.89809	67 m	0:00:19	13 kph
7/4/2017 12:53	ON	N22.15210 E113.89806	57 m	0:00:16	13 kph
7/4/2017 12:53	ON	N22.15271 E113.89803	69 m	0:00:19	13 kph
7/4/2017 12:54	ON	N22.15323 E113.89805	58 m	0:00:16	13 kph
7/4/2017 12:54	ON	N22.15366 E113.89809	47 m	0:00:13	13 kph
7/4/2017 12:54	ON	N22.15417 E113.89808	58 m	0:00:16	13 kph
7/4/2017 12:54	ON	N22.15476 E113.89807	65 m	0:00:18	13 kph
7/4/2017 12:55	ON	N22.15535 E113.89806	66 m	0:00:18	13 kph
7/4/2017 12:55	ON	N22.15593 E113.89806	65 m	0:00:17	14 kph
7/4/2017 12:55	ON	N22.15657 E113.89803	71 m	0:00:19	13 kph
7/4/2017 12:56	ON	N22.15720 E113.89803	70 m	0:00:19	13 kph
7/4/2017 12:56	ON	N22.15776 E113.89801	63 m	0:00:17	13 kph
7/4/2017 12:56	ON	N22.15833 E113.89798	63 m	0:00:17	13 kph
7/4/2017 12:56	ON	N22.15899 E113.89793	73 m	0:00:20	13 kph
7/4/2017 12:57	ON	N22.15965 E113.89782	75 m	0:00:20	13 kph
7/4/2017 12:57	ON	N22.16028 E113.89774	71 m	0:00:19	13 kph
7/4/2017 12:57	ON	N22.16095 E113.89769	74 m	0:00:20	13 kph
7/4/2017 12:58	ON	N22.16182 E113.89766	97 m	0:00:25	14 kph
7/4/2017 12:58	ON	N22.16259 E113.89761	86 m	0:00:22	14 kph
7/4/2017 12:59	ON	N22.16346 E113.89749	97 m	0:00:25	14 kph
7/4/2017 12:59	ON	N22.16429 E113.89747	93 m	0:00:24	14 kph
7/4/2017 12:59	ON	N22.16503 E113.89745	82 m	0:00:21	14 kph
7/4/2017 13:00	ON	N22.16592 E113.89743	99 m	0:00:25	14 kph
7/4/2017 13:00	ON	N22.16677 E113.89735	96 m	0:00:24	14 kph
7/4/2017 13:01	ON	N22.16769 E113.89728	102 m	0:00:26	14 kph
7/4/2017 13:01	ON	N22.16846 E113.89721	87 m	0:00:22	14 kph
7/4/2017 13:01	ON	N22.16937 E113.89709	101 m	0:00:26	14 kph
7/4/2017 13:02	ON	N22.17030 E113.89701	105 m	0:00:27	14 kph
7/4/2017 13:02	ON	N22.17120 E113.89709	99 m	0:00:26	14 kph
7/4/2017 13:03	ON	N22.17187 E113.89717	75 m	0:00:19	14 kph
7/4/2017 13:03	ON	N22.17250 E113.89728	71 m	0:00:18	14 kph
7/4/2017 13:03	ON	N22.17329 E113.89740	89 m	0:00:23	14 kph
7/4/2017 13:04	ON	N22.17399 E113.89745	78 m	0:00:20	14 kph
7/4/2017 13:04	ON	N22.17468 E113.89743	78 m	0:00:20	14 kph
7/4/2017 13:04	ON	N22.17539 E113.89744	79 m	0:00:20	14 kph
7/4/2017 13:05	ON	N22.17604 E113.89746	72 m	0:00:18	14 kph
7/4/2017 13:05	ON	N22.17682 E113.89747	87 m	0:00:22	14 kph
7/4/2017 13:05	ON	N22.17750 E113.89744	76 m	0:00:19	14 kph
7/4/2017 13:06	ON	N22.17819 E113.89753	78 m	0:00:20	14 kph
7/4/2017 13:06	ON	N22.17888 E113.89754	76 m	0:00:20	14 kph
7/4/2017 13:06	ON	N22.17967 E113.89757	88 m	0:00:23	14 kph
7/4/2017 13:07	ON	N22.18035 E113.89762	76 m	0:00:20	14 kph
7/4/2017 13:07	ON	N22.18086 E113.89764	57 m	0:00:15	14 kph
7/4/2017 13:07	ON	N22.18147 E113.89767	68 m	0:00:18	14 kph
7/4/2017 13:08	ON	N22.18228 E113.89770	91 m	0:00:24	14 kph
7/4/2017 13:08	ON	N22.18303 E113.89769	83 m	0:00:22	14 kph
7/4/2017 13:08	ON	N22.18365 E113.89767	69 m	0:00:18	14 kph
7/4/2017 13:09	ON	N22.18416 E113.89766	57 m	0:00:15	14 kph
7/4/2017 13:09	ON	N22.18466 E113.89762	57 m	0:00:15	14 kph
7/4/2017 13:09	ON	N22.18522 E113.89758	62 m	0:00:16	14 kph
7/4/2017 13:09	ON	N22.18563 E113.89753	46 m	0:00:12	14 kph
7/4/2017 13:10	ON	N22.18615 E113.89747	59 m	0:00:15	14 kph
7/4/2017 13:10	ON	N22.18686 E113.89748	78 m	0:00:20	14 kph
7/4/2017 13:10	ON	N22.18759 E113.89743	82 m	0:00:21	14 kph
7/4/2017 13:11	ON	N22.18826 E113.89744	74 m	0:00:19	14 kph
7/4/2017 13:11	ON	N22.18893 E113.89748	75 m	0:00:19	14 kph
7/4/2017 13:11	ON	N22.18963 E113.89754	79 m	0:00:20	14 kph
7/4/2017 13:11	ON	N22.19020 E113.89762	63 m	0:00:16	14 kph
7/4/2017 13:12	ON	N22.19094 E113.89768	83 m	0:00:21	14 kph
7/4/2017 13:12	ON	N22.19173 E113.89772	88 m	0:00:22	14 kph
7/4/2017 13:13	ON	N22.19264 E113.89773	102 m	0:00:26	14 kph
7/4/2017 13:13	ON	N22.19335 E113.89771	78 m	0:00:20	14 kph
7/4/2017 13:13	ON	N22.19401 E113.89770	74 m	0:00:19	14 kph

## Appendix I. (cont'd)

Date & Time	EFFORT	Position	Leg Length	Leg Time	Leg Speed
7/4/2017 13:14	ON	N22.19484 E113.89774	92 m	0:00:23	14 kph
7/4/2017 13:14	ON	N22.19555 E113.89772	80 m	0:00:20	14 kph
7/4/2017 13:14	ON	N22.19636 E113.89764	90 m	0:00:23	14 kph
7/4/2017 13:15	ON	N22.19705 E113.89758	78 m	0:00:20	14 kph
7/4/2017 13:15	ON	N22.19762 E113.89758	64 m	0:00:16	14 kph
7/4/2017 13:15	ON	N22.19813 E113.89757	56 m	0:00:14	14 kph
7/4/2017 13:15	ON	N22.19870 E113.89755	64 m	0:00:16	14 kph
7/4/2017 13:16	ON	N22.19924 E113.89756	60 m	0:00:15	14 kph
7/4/2017 13:16	ON	N22.19997 E113.89758	81 m	0:00:20	15 kph
7/4/2017 13:16	ON	N22.20076 E113.89760	88 m	0:00:22	14 kph
7/4/2017 13:17	ON	N22.20148 E113.89763	81 m	0:00:20	15 kph
7/4/2017 13:17	ON	N22.20225 E113.89762	85 m	0:00:21	15 kph
7/4/2017 13:17	ON	N22.20306 E113.89764	90 m	0:00:22	15 kph
7/4/2017 13:18	ON	N22.20378 E113.89762	81 m	0:00:20	15 kph
7/4/2017 13:18	ON	N22.20457 E113.89758	88 m	0:00:22	14 kph
7/4/2017 13:19	ON	N22.20530 E113.89754	81 m	0:00:20	15 kph
7/4/2017 13:19	ON	N22.20613 E113.89752	93 m	0:00:23	15 kph
7/4/2017 13:19	ON	N22.20674 E113.89749	68 m	0:00:17	14 kph
7/4/2017 13:20	ON	N22.20770 E113.89748	106 m	0:00:26	15 kph
7/4/2017 13:20	ON	N22.20849 E113.89745	88 m	0:00:22	14 kph
7/4/2017 13:20	ON	N22.20940 E113.89754	102 m	0:00:25	15 kph
7/4/2017 13:21	ON	N22.21023 E113.89759	93 m	0:00:23	15 kph
7/4/2017 13:21	ON	N22.21089 E113.89776	75 m	0:00:19	14 kph
7/4/2017 13:21	ON	N22.21112 E113.89821	53 m	0:00:15	13 kph
7/4/2017 13:22	ON	N22.21104 E113.89873	55 m	0:00:15	13 kph
7/4/2017 13:22	ON	N22.21085 E113.89912	45 m	0:00:12	14 kph
7/4/2017 13:22	ON	N22.21048 E113.89963	67 m	0:00:17	14 kph
7/4/2017 13:22	ON	N22.20998 E113.90035	92 m	0:00:23	14 kph
7/4/2017 13:23	ON	N22.20954 E113.90111	93 m	0:00:23	15 kph
7/4/2017 13:23	ON	N22.20912 E113.90179	85 m	0:00:21	15 kph
7/4/2017 13:24	ON	N22.20874 E113.90243	78 m	0:00:19	15 kph
7/4/2017 13:24	ON	N22.20848 E113.90290	57 m	0:00:14	15 kph
7/4/2017 13:24	ON	N22.20820 E113.90346	65 m	0:00:16	15 kph
7/4/2017 13:24	ON	N22.20785 E113.90410	77 m	0:00:19	15 kph
7/4/2017 13:25	ON	N22.20735 E113.90484	95 m	0:00:23	15 kph
7/4/2017 13:25	ON	N22.20690 E113.90558	91 m	0:00:22	15 kph
7/4/2017 13:25	ON	N22.20637 E113.90621	87 m	0:00:21	15 kph
7/4/2017 13:26	ON	N22.20585 E113.90684	88 m	0:00:21	15 kph
7/4/2017 13:26	ON	N22.20560 E113.90750	74 m	0:00:18	15 kph
7/4/2017 13:26	ON	N22.20533 E113.90813	72 m	0:00:18	14 kph
7/4/2017 13:27	ON	N22.20492 E113.90836	51 m	0:00:15	12 kph
7/4/2017 13:27	ON	N22.20427 E113.90841	73 m	0:00:21	13 kph
7/4/2017 13:27	ON	N22.20370 E113.90845	63 m	0:00:16	14 kph
7/4/2017 13:28	ON	N22.20299 E113.90841	80 m	0:00:20	14 kph
7/4/2017 13:28	ON	N22.20234 E113.90838	72 m	0:00:18	14 kph
7/4/2017 13:28	ON	N22.20174 E113.90837	67 m	0:00:17	14 kph
7/4/2017 13:28	ON	N22.20113 E113.90839	68 m	0:00:17	14 kph
7/4/2017 13:29	ON	N22.20049 E113.90834	71 m	0:00:18	14 kph
7/4/2017 13:29	ON	N22.19981 E113.90830	75 m	0:00:19	14 kph
7/4/2017 13:29	ON	N22.19905 E113.90833	85 m	0:00:21	15 kph
7/4/2017 13:30	ON	N22.19829 E113.90825	85 m	0:00:22	14 kph
7/4/2017 13:30	ON	N22.19750 E113.90818	87 m	0:00:23	14 kph
7/4/2017 13:30	ON	N22.19682 E113.90815	76 m	0:00:20	14 kph
7/4/2017 13:31	ON	N22.19607 E113.90811	84 m	0:00:22	14 kph
7/4/2017 13:31	ON	N22.19531 E113.90809	85 m	0:00:22	14 kph
7/4/2017 13:32	ON	N22.19462 E113.90812	78 m	0:00:20	14 kph
7/4/2017 13:32	ON	N22.19393 E113.90810	76 m	0:00:20	14 kph
7/4/2017 13:32	ON	N22.19325 E113.90809	76 m	0:00:20	14 kph
7/4/2017 13:33	ON	N22.19264 E113.90805	68 m	0:00:18	14 kph
7/4/2017 13:33	ON	N22.19194 E113.90799	78 m	0:00:20	14 kph
7/4/2017 13:33	ON	N22.19128 E113.90788	74 m	0:00:19	14 kph
7/4/2017 13:33	ON	N22.19063 E113.90773	74 m	0:00:19	14 kph
7/4/2017 13:34	ON	N22.18998 E113.90758	74 m	0:00:19	14 kph
7/4/2017 13:34	ON	N22.18928 E113.90733	82 m	0:00:21	14 kph

## Appendix I. (cont'd)

Date & Time	EFFORT	Position	Leg Length	Leg Time	Leg Speed
7/4/2017 13:34	ON	N22.18885 E113.90690	65 m	0:00:18	13 kph
7/4/2017 13:35	ON	N22.18857 E113.90646	56 m	0:00:15	13 kph
7/4/2017 13:35	ON	N22.18809 E113.90594	75 m	0:00:20	14 kph
7/4/2017 13:35	ON	N22.18733 E113.90549	96 m	0:00:25	14 kph
7/4/2017 13:36	ON	N22.18656 E113.90521	91 m	0:00:24	14 kph
7/4/2017 13:36	ON	N22.18563 E113.90500	106 m	0:00:28	14 kph
7/4/2017 13:37	ON	N22.18488 E113.90476	87 m	0:00:23	14 kph
7/4/2017 13:37	ON	N22.18391 E113.90451	111 m	0:00:29	14 kph
7/4/2017 13:38	ON	N22.18307 E113.90445	95 m	0:00:25	14 kph
7/4/2017 13:38	ON	N22.18219 E113.90440	98 m	0:00:26	14 kph
7/4/2017 13:38	ON	N22.18135 E113.90434	94 m	0:00:25	13 kph
7/4/2017 13:39	ON	N22.18064 E113.90432	79 m	0:00:21	13 kph
7/4/2017 13:39	ON	N22.17991 E113.90438	82 m	0:00:22	13 kph
7/4/2017 13:40	ON	N22.17903 E113.90473	104 m	0:00:28	13 kph
7/4/2017 13:40	ON	N22.17849 E113.90511	72 m	0:00:19	14 kph
7/4/2017 13:40	ON	N22.17786 E113.90574	95 m	0:00:25	14 kph
7/4/2017 13:41	ON	N22.17735 E113.90630	81 m	0:00:21	14 kph
7/4/2017 13:41	ON	N22.17675 E113.90700	98 m	0:00:25	14 kph
7/4/2017 13:41	ON	N22.17617 E113.90750	82 m	0:00:21	14 kph
7/4/2017 13:42	ON	N22.17548 E113.90789	87 m	0:00:22	14 kph
7/4/2017 13:42	ON	N22.17485 E113.90814	75 m	0:00:19	14 kph
7/4/2017 13:43	ON	N22.17407 E113.90829	87 m	0:00:22	14 kph
7/4/2017 13:43	ON	N22.17329 E113.90840	88 m	0:00:22	14 kph
7/4/2017 13:43	ON	N22.17263 E113.90840	74 m	0:00:19	14 kph
7/4/2017 13:44	ON	N22.17193 E113.90814	83 m	0:00:21	14 kph
7/4/2017 13:44	ON	N22.17127 E113.90769	87 m	0:00:22	14 kph
7/4/2017 13:44	ON	N22.17063 E113.90708	95 m	0:00:24	14 kph
7/4/2017 13:45	ON	N22.16993 E113.90632	111 m	0:00:28	14 kph
7/4/2017 13:45	ON	N22.16923 E113.90553	113 m	0:00:28	15 kph
7/4/2017 13:46	ON	N22.16850 E113.90470	118 m	0:00:29	15 kph
7/4/2017 13:46	ON	N22.16777 E113.90388	117 m	0:00:29	14 kph
7/4/2017 13:47	ON	N22.16713 E113.90311	107 m	0:00:26	15 kph
7/4/2017 13:47	ON	N22.16654 E113.90227	108 m	0:00:27	14 kph
7/4/2017 13:48	ON	N22.16601 E113.90153	96 m	0:00:24	14 kph
7/4/2017 13:48	ON	N22.16534 E113.90079	107 m	0:00:27	14 kph
7/4/2017 13:48	ON	N22.16455 E113.90009	114 m	0:00:28	15 kph
7/4/2017 13:49	ON	N22.16371 E113.89945	114 m	0:00:28	15 kph
7/4/2017 13:49	ON	N22.16295 E113.89893	100 m	0:00:25	14 kph
7/4/2017 13:50	ON	N22.16215 E113.89851	99 m	0:00:25	14 kph
7/4/2017 13:50	ON	N22.16124 E113.89832	103 m	0:00:26	14 kph
7/4/2017 13:51	ON	N22.16035 E113.89830	98 m	0:00:24	15 kph
7/4/2017 13:51	ON	N22.15966 E113.89845	79 m	0:00:19	15 kph
7/4/2017 13:51	ON	N22.15911 E113.89868	66 m	0:00:16	15 kph
7/4/2017 13:51	ON	N22.15864 E113.89895	59 m	0:00:14	15 kph
7/4/2017 13:52	ON	N22.15820 E113.89937	66 m	0:00:16	15 kph
7/4/2017 13:52	ON	N22.15773 E113.89979	68 m	0:00:17	14 kph
7/4/2017 13:52	ON	N22.15714 E113.90034	86 m	0:00:21	15 kph
7/4/2017 13:53	ON	N22.15659 E113.90095	88 m	0:00:21	15 kph
7/4/2017 13:53	ON	N22.15620 E113.90150	71 m	0:00:17	15 kph
7/4/2017 13:53	ON	N22.15576 E113.90225	91 m	0:00:22	15 kph
7/4/2017 13:54	ON	N22.15556 E113.90286	66 m	0:00:16	15 kph
7/4/2017 13:54	ON	N22.15553 E113.90350	66 m	0:00:16	15 kph
7/4/2017 13:54	ON	N22.15565 E113.90425	79 m	0:00:19	15 kph
7/4/2017 13:54	ON	N22.15593 E113.90503	86 m	0:00:21	15 kph
7/4/2017 13:55	ON	N22.15637 E113.90559	75 m	0:00:19	14 kph
7/4/2017 13:55	ON	N22.15669 E113.90607	62 m	0:00:16	14 kph
7/4/2017 13:55	ON	N22.15697 E113.90674	76 m	0:00:20	14 kph
7/4/2017 13:56	ON	N22.15685 E113.90717	46 m	0:00:14	12 kph
7/4/2017 13:56	ON	N22.15641 E113.90737	52 m	0:00:15	13 kph
7/4/2017 13:56	ON	N22.15583 E113.90744	65 m	0:00:17	14 kph
7/4/2017 13:56	ON	N22.15518 E113.90766	76 m	0:00:19	14 kph
7/4/2017 13:57	ON	N22.15469 E113.90775	55 m	0:00:14	14 kph
7/4/2017 13:57	ON	N22.15406 E113.90774	71 m	0:00:18	14 kph
7/4/2017 13:57	ON	N22.15336 E113.90760	79 m	0:00:20	14 kph

## Appendix I. (cont'd)

Date & Time	EFFORT	Position	Leg Length	Leg Time	Leg Speed
7/4/2017 13:58	ON	N22.15260 E113.90755	84 m	0:00:21	14 kph
7/4/2017 13:58	ON	N22.15203 E113.90752	64 m	0:00:16	14 kph
7/4/2017 13:58	ON	N22.15149 E113.90746	60 m	0:00:15	14 kph
7/4/2017 13:59	ON	N22.15080 E113.90741	78 m	0:00:19	15 kph
7/4/2017 13:59	ON	N22.15006 E113.90737	82 m	0:00:20	15 kph
7/4/2017 13:59	ON	N22.14943 E113.90737	70 m	0:00:17	15 kph
7/4/2017 13:59	ON	N22.14872 E113.90739	78 m	0:00:19	15 kph
7/4/2017 14:00	ON	N22.14802 E113.90738	78 m	0:00:19	15 kph
7/4/2017 14:00	ON	N22.14748 E113.90730	61 m	0:00:15	15 kph
7/4/2017 14:00	ON	N22.14679 E113.90720	78 m	0:00:19	15 kph
7/4/2017 14:01	ON	N22.14622 E113.90704	66 m	0:00:16	15 kph
7/4/2017 14:01	ON	N22.14559 E113.90676	76 m	0:00:19	14 kph
7/4/2017 14:01	ON	N22.14503 E113.90658	64 m	0:00:16	14 kph
7/4/2017 14:01	ON	N22.14452 E113.90655	57 m	0:00:14	15 kph
7/4/2017 14:02	ON	N22.14377 E113.90653	83 m	0:00:20	15 kph
7/4/2017 14:02	ON	N22.14313 E113.90651	71 m	0:00:17	15 kph
7/4/2017 14:02	ON	N22.14254 E113.90645	66 m	0:00:16	15 kph
7/4/2017 14:03	ON	N22.14209 E113.90654	50 m	0:00:13	14 kph
7/4/2017 14:03	ON	N22.14193 E113.90694	45 m	0:00:13	12 kph
7/4/2017 14:03	ON	N22.14201 E113.90758	66 m	0:00:17	14 kph
7/4/2017 14:03	ON	N22.14192 E113.90840	86 m	0:00:21	15 kph
7/4/2017 14:04	ON	N22.14184 E113.90897	59 m	0:00:14	15 kph
7/4/2017 14:04	ON	N22.14174 E113.90977	84 m	0:00:20	15 kph
7/4/2017 14:04	ON	N22.14166 E113.91042	68 m	0:00:16	15 kph
7/4/2017 14:05	ON	N22.14162 E113.91115	75 m	0:00:18	15 kph
7/4/2017 14:05	ON	N22.14166 E113.91196	84 m	0:00:20	15 kph
7/4/2017 14:05	ON	N22.14170 E113.91265	71 m	0:00:17	15 kph
7/4/2017 14:05	ON	N22.14172 E113.91342	80 m	0:00:19	15 kph
7/4/2017 14:06	ON	N22.14173 E113.91419	80 m	0:00:19	15 kph
7/4/2017 14:06	ON	N22.14174 E113.91488	71 m	0:00:17	15 kph
7/4/2017 14:06	ON	N22.14183 E113.91587	102 m	0:00:24	15 kph
7/4/2017 14:07	ON	N22.14190 E113.91660	76 m	0:00:18	15 kph
7/4/2017 14:07	ON	N22.14205 E113.91729	73 m	0:00:18	15 kph
7/4/2017 14:07	ON	N22.14246 E113.91773	65 m	0:00:17	14 kph
7/4/2017 14:08	ON	N22.14305 E113.91797	70 m	0:00:18	14 kph
7/4/2017 14:08	ON	N22.14365 E113.91805	68 m	0:00:18	14 kph
7/4/2017 14:08	ON	N22.14437 E113.91810	80 m	0:00:21	14 kph
7/4/2017 14:09	ON	N22.14498 E113.91819	69 m	0:00:18	14 kph
7/4/2017 14:09	ON	N22.14563 E113.91820	72 m	0:00:19	14 kph
7/4/2017 14:09	ON	N22.14636 E113.91825	81 m	0:00:21	14 kph
7/4/2017 14:10	ON	N22.14694 E113.91827	65 m	0:00:17	14 kph
7/4/2017 14:10	ON	N22.14760 E113.91825	73 m	0:00:19	14 kph
7/4/2017 14:10	ON	N22.14830 E113.91823	78 m	0:00:20	14 kph
7/4/2017 14:11	ON	N22.14901 E113.91825	79 m	0:00:20	14 kph
7/4/2017 14:11	ON	N22.14978 E113.91831	87 m	0:00:22	14 kph
7/4/2017 14:11	ON	N22.15036 E113.91837	64 m	0:00:16	14 kph
7/4/2017 14:11	ON	N22.15088 E113.91839	58 m	0:00:15	14 kph
7/4/2017 14:12	ON	N22.15159 E113.91843	80 m	0:00:20	14 kph
7/4/2017 14:12	ON	N22.15239 E113.91850	89 m	0:00:22	15 kph
7/4/2017 14:12	ON	N22.15299 E113.91856	68 m	0:00:17	14 kph
7/4/2017 14:13	ON	N22.15366 E113.91868	75 m	0:00:19	14 kph
7/4/2017 14:13	ON	N22.15423 E113.91875	63 m	0:00:16	14 kph
7/4/2017 14:13	ON	N22.15510 E113.91881	97 m	0:00:24	15 kph
7/4/2017 14:14	ON	N22.15605 E113.91885	106 m	0:00:26	15 kph
7/4/2017 14:14	ON	N22.15690 E113.91875	95 m	0:00:24	14 kph
7/4/2017 14:15	ON	N22.15755 E113.91877	73 m	0:00:18	15 kph
7/4/2017 14:15	ON	N22.15836 E113.91888	90 m	0:00:22	15 kph
7/4/2017 14:15	ON	N22.15908 E113.91896	82 m	0:00:20	15 kph
7/4/2017 14:16	ON	N22.15980 E113.91900	80 m	0:00:19	15 kph
7/4/2017 14:16	ON	N22.16064 E113.91907	93 m	0:00:22	15 kph
7/4/2017 14:16	ON	N22.16144 E113.91914	89 m	0:00:21	15 kph
7/4/2017 14:17	ON	N22.16214 E113.91918	79 m	0:00:19	15 kph
7/4/2017 14:17	ON	N22.16293 E113.91916	88 m	0:00:21	15 kph
7/4/2017 14:17	ON	N22.16369 E113.91913	84 m	0:00:20	15 kph

## Appendix I. (cont'd)

Date & Time	EFFORT	Position	Leg Length	Leg Time	Leg Speed
7/4/2017 14:18	ON	N22.16440 E113.91913	79 m	0:00:19	15 kph
7/4/2017 14:18	ON	N22.16511 E113.91916	80 m	0:00:19	15 kph
7/4/2017 14:18	ON	N22.16597 E113.91923	96 m	0:00:23	15 kph
7/4/2017 14:19	ON	N22.16671 E113.91927	83 m	0:00:20	15 kph
7/4/2017 14:19	ON	N22.16737 E113.91933	74 m	0:00:18	15 kph
7/4/2017 14:19	ON	N22.16808 E113.91936	79 m	0:00:19	15 kph
7/4/2017 14:20	ON	N22.16884 E113.91942	85 m	0:00:21	14 kph
7/4/2017 14:20	ON	N22.16952 E113.91965	80 m	0:00:20	14 kph
7/4/2017 14:20	ON	N22.17024 E113.91976	81 m	0:00:20	15 kph
7/4/2017 14:21	ON	N22.17095 E113.91987	80 m	0:00:20	14 kph
7/4/2017 14:21	ON	N22.17155 E113.91994	67 m	0:00:17	14 kph
7/4/2017 14:21	ON	N22.17218 E113.92009	72 m	0:00:18	14 kph
7/4/2017 14:21	ON	N22.17290 E113.92023	81 m	0:00:20	15 kph
7/4/2017 14:22	ON	N22.17358 E113.92034	77 m	0:00:19	15 kph
7/4/2017 14:22	ON	N22.17422 E113.92046	72 m	0:00:18	14 kph
7/4/2017 14:22	ON	N22.17478 E113.92064	65 m	0:00:16	15 kph
7/4/2017 14:23	ON	N22.17538 E113.92081	68 m	0:00:17	14 kph
7/4/2017 14:23	ON	N22.17591 E113.92092	60 m	0:00:15	14 kph
7/4/2017 14:23	ON	N22.17647 E113.92103	64 m	0:00:16	14 kph
7/4/2017 14:24	ON	N22.17726 E113.92118	89 m	0:00:22	14 kph
7/4/2017 14:24	ON	N22.17811 E113.92129	96 m	0:00:24	14 kph
7/4/2017 14:24	ON	N22.17894 E113.92141	93 m	0:00:23	15 kph
7/4/2017 14:25	ON	N22.17974 E113.92151	90 m	0:00:22	15 kph
7/4/2017 14:25	ON	N22.18055 E113.92162	90 m	0:00:22	15 kph
7/4/2017 14:25	ON	N22.18138 E113.92152	93 m	0:00:23	15 kph
7/4/2017 14:26	ON	N22.18201 E113.92103	87 m	0:00:21	15 kph
7/4/2017 14:26	ON	N22.18263 E113.92048	89 m	0:00:21	15 kph
7/4/2017 14:27	ON	N22.18334 E113.91972	111 m	0:00:26	15 kph
7/4/2017 14:27	ON	N22.18384 E113.91902	92 m	0:00:22	15 kph
7/4/2017 14:27	ON	N22.18426 E113.91838	81 m	0:00:19	15 kph
7/4/2017 14:28	ON	N22.18473 E113.91805	63 m	0:00:16	14 kph
7/4/2017 14:28	ON	N22.18537 E113.91800	71 m	0:00:18	14 kph
7/4/2017 14:28	ON	N22.18608 E113.91804	79 m	0:00:19	15 kph
7/4/2017 14:28	ON	N22.18686 E113.91809	86 m	0:00:21	15 kph
7/4/2017 14:29	ON	N22.18762 E113.91823	86 m	0:00:21	15 kph
7/4/2017 14:29	ON	N22.18825 E113.91831	71 m	0:00:17	15 kph
7/4/2017 14:29	ON	N22.18904 E113.91839	87 m	0:00:21	15 kph
7/4/2017 14:30	ON	N22.18978 E113.91863	86 m	0:00:21	15 kph
7/4/2017 14:30	ON	N22.19049 E113.91885	82 m	0:00:20	15 kph
7/4/2017 14:30	ON	N22.19114 E113.91901	75 m	0:00:18	15 kph
7/4/2017 14:31	ON	N22.19202 E113.91917	99 m	0:00:24	15 kph
7/4/2017 14:31	ON	N22.19274 E113.91912	81 m	0:00:20	15 kph
7/4/2017 14:32	ON	N22.19350 E113.91902	85 m	0:00:21	15 kph
7/4/2017 14:32	ON	N22.19407 E113.91902	64 m	0:00:16	14 kph
7/4/2017 14:32	ON	N22.19471 E113.91900	71 m	0:00:18	14 kph
7/4/2017 14:32	ON	N22.19538 E113.91895	75 m	0:00:19	14 kph
7/4/2017 14:33	ON	N22.19613 E113.91897	83 m	0:00:21	14 kph
7/4/2017 14:33	ON	N22.19683 E113.91889	79 m	0:00:20	14 kph
7/4/2017 14:33	ON	N22.19757 E113.91872	84 m	0:00:21	14 kph
7/4/2017 14:34	ON	N22.19829 E113.91865	80 m	0:00:20	14 kph
7/4/2017 14:34	ON	N22.19899 E113.91867	78 m	0:00:19	15 kph
7/4/2017 14:34	ON	N22.19979 E113.91879	90 m	0:00:22	15 kph
7/4/2017 14:35	ON	N22.20076 E113.91906	112 m	0:00:27	15 kph
7/4/2017 14:35	ON	N22.20145 E113.91924	79 m	0:00:19	15 kph
7/4/2017 14:35	ON	N22.20202 E113.91921	63 m	0:00:16	14 kph
7/4/2017 14:36	ON	N22.20264 E113.91898	73 m	0:00:18	15 kph
7/4/2017 14:36	ON	N22.20341 E113.91886	86 m	0:00:22	14 kph
7/4/2017 14:36	ON	N22.20409 E113.91899	77 m	0:00:19	15 kph
7/4/2017 14:37	ON	N22.20457 E113.91936	66 m	0:00:17	14 kph
7/4/2017 14:37	ON	N22.20483 E113.91996	69 m	0:00:17	15 kph
7/4/2017 14:37	ON	N22.20511 E113.92086	98 m	0:00:23	15 kph
7/4/2017 14:38	ON	N22.20534 E113.92165	84 m	0:00:20	15 kph
7/4/2017 14:38	ON	N22.20551 E113.92240	80 m	0:00:19	15 kph
7/4/2017 14:38	ON	N22.20562 E113.92304	67 m	0:00:16	15 kph

## Appendix I. (cont'd)

Date & Time	EFFORT	Position	Leg Length	Leg Time	Leg Speed
7/4/2017 14:39	ON	N22.20572 E113.92382	80 m	0:00:19	15 kph
7/4/2017 14:39	ON	N22.20571 E113.92460	80 m	0:00:19	15 kph
7/4/2017 14:39	ON	N22.20574 E113.92543	86 m	0:00:20	16 kph
7/4/2017 14:40	ON	N22.20571 E113.92622	82 m	0:00:19	15 kph
7/4/2017 14:40	ON	N22.20568 E113.92711	91 m	0:00:21	16 kph
7/4/2017 14:40	ON	N22.20549 E113.92769	64 m	0:00:17	13 kph
7/4/2017 14:41	ON	N22.20499 E113.92787	59 m	0:00:16	13 kph
7/4/2017 14:41	ON	N22.20440 E113.92797	66 m	0:00:16	15 kph
7/4/2017 14:41	ON	N22.20380 E113.92791	67 m	0:00:17	14 kph
7/4/2017 14:41	ON	N22.20325 E113.92788	62 m	0:00:16	14 kph
7/4/2017 14:42	ON	N22.20268 E113.92796	64 m	0:00:16	14 kph
7/4/2017 14:42	ON	N22.20211 E113.92795	63 m	0:00:16	14 kph
7/4/2017 14:42	ON	N22.20158 E113.92791	59 m	0:00:15	14 kph
7/4/2017 14:42	ON	N22.20097 E113.92791	67 m	0:00:17	14 kph
7/4/2017 14:43	ON	N22.20015 E113.92794	92 m	0:00:23	14 kph
7/4/2017 14:43	ON	N22.19957 E113.92795	64 m	0:00:16	14 kph
7/4/2017 14:43	ON	N22.19896 E113.92798	68 m	0:00:17	14 kph
7/4/2017 14:44	ON	N22.19841 E113.92796	61 m	0:00:15	15 kph
7/4/2017 14:44	ON	N22.19780 E113.92793	69 m	0:00:17	15 kph
7/4/2017 14:44	ON	N22.19715 E113.92791	72 m	0:00:18	14 kph
7/4/2017 14:44	ON	N22.19654 E113.92791	68 m	0:00:17	14 kph
7/4/2017 14:45	ON	N22.19584 E113.92788	77 m	0:00:19	15 kph
7/4/2017 14:45	ON	N22.19498 E113.92786	97 m	0:00:24	15 kph
7/4/2017 14:46	ON	N22.19414 E113.92784	93 m	0:00:23	15 kph
7/4/2017 14:46	ON	N22.19334 E113.92783	89 m	0:00:22	15 kph
7/4/2017 14:46	ON	N22.19254 E113.92780	89 m	0:00:22	15 kph
7/4/2017 14:47	ON	N22.19204 E113.92777	56 m	0:00:14	15 kph
7/4/2017 14:47	ON	N22.19142 E113.92778	68 m	0:00:17	14 kph
7/4/2017 14:47	ON	N22.19074 E113.92778	76 m	0:00:19	14 kph
7/4/2017 14:47	ON	N22.18999 E113.92772	84 m	0:00:21	14 kph
7/4/2017 14:48	ON	N22.18927 E113.92767	80 m	0:00:20	14 kph
7/4/2017 14:48	ON	N22.18854 E113.92766	81 m	0:00:20	15 kph
7/4/2017 14:48	ON	N22.18789 E113.92762	73 m	0:00:18	15 kph
7/4/2017 14:49	ON	N22.18702 E113.92764	97 m	0:00:24	15 kph
7/4/2017 14:49	ON	N22.18634 E113.92767	76 m	0:00:19	14 kph
7/4/2017 14:49	ON	N22.18575 E113.92769	65 m	0:00:16	15 kph
7/4/2017 14:50	ON	N22.18498 E113.92770	86 m	0:00:21	15 kph
7/4/2017 14:50	ON	N22.18428 E113.92766	77 m	0:00:19	15 kph
7/4/2017 14:50	ON	N22.18346 E113.92766	92 m	0:00:23	14 kph
7/4/2017 14:51	ON	N22.18281 E113.92766	72 m	0:00:18	14 kph
7/4/2017 14:51	ON	N22.18206 E113.92768	83 m	0:00:21	14 kph
7/4/2017 14:52	ON	N22.18113 E113.92775	104 m	0:00:26	14 kph
7/4/2017 14:52	ON	N22.18034 E113.92779	87 m	0:00:22	14 kph
7/4/2017 14:52	ON	N22.17969 E113.92774	72 m	0:00:18	14 kph
7/4/2017 14:53	ON	N22.17897 E113.92765	81 m	0:00:20	15 kph
7/4/2017 14:53	ON	N22.17818 E113.92758	89 m	0:00:22	15 kph
7/4/2017 14:53	ON	N22.17748 E113.92754	77 m	0:00:19	15 kph
7/4/2017 14:54	ON	N22.17678 E113.92749	78 m	0:00:19	15 kph
7/4/2017 14:54	ON	N22.17602 E113.92747	85 m	0:00:21	15 kph
7/4/2017 14:54	ON	N22.17533 E113.92746	77 m	0:00:19	15 kph
7/4/2017 14:55	ON	N22.17461 E113.92734	80 m	0:00:20	14 kph
7/4/2017 14:55	ON	N22.17393 E113.92728	77 m	0:00:19	15 kph
7/4/2017 14:55	ON	N22.17339 E113.92722	60 m	0:00:15	14 kph
7/4/2017 14:55	ON	N22.17271 E113.92709	77 m	0:00:19	15 kph
7/4/2017 14:56	ON	N22.17217 E113.92699	61 m	0:00:15	15 kph
7/4/2017 14:56	ON	N22.17140 E113.92693	85 m	0:00:21	15 kph
7/4/2017 14:56	ON	N22.17086 E113.92688	61 m	0:00:15	15 kph
7/4/2017 14:57	ON	N22.17017 E113.92681	77 m	0:00:19	15 kph
7/4/2017 14:57	ON	N22.16954 E113.92675	71 m	0:00:17	15 kph
7/4/2017 14:57	ON	N22.16883 E113.92672	78 m	0:00:19	15 kph
7/4/2017 14:57	ON	N22.16819 E113.92671	71 m	0:00:17	15 kph
7/4/2017 14:58	ON	N22.16752 E113.92671	75 m	0:00:18	15 kph
7/4/2017 14:58	ON	N22.16680 E113.92666	80 m	0:00:19	15 kph
7/4/2017 14:58	ON	N22.16609 E113.92662	79 m	0:00:19	15 kph

## Appendix I. (cont'd)

Date & Time	EFFORT	Position	Leg Length	Leg Time	Leg Speed
7/4/2017 14:59	ON	N22.16537 E113.92658	80 m	0:00:19	15 kph
7/4/2017 14:59	ON	N22.16473 E113.92651	72 m	0:00:17	15 kph
7/4/2017 14:59	ON	N22.16416 E113.92649	63 m	0:00:15	15 kph
7/4/2017 15:00	ON	N22.16349 E113.92652	75 m	0:00:18	15 kph
7/4/2017 15:00	ON	N22.16284 E113.92648	72 m	0:00:17	15 kph
7/4/2017 15:00	ON	N22.16208 E113.92637	85 m	0:00:20	15 kph
7/4/2017 15:00	ON	N22.16140 E113.92633	76 m	0:00:18	15 kph
7/4/2017 15:01	ON	N22.16072 E113.92634	76 m	0:00:18	15 kph
7/4/2017 15:01	ON	N22.16005 E113.92638	75 m	0:00:18	15 kph
7/4/2017 15:01	ON	N22.15942 E113.92638	70 m	0:00:17	15 kph
7/4/2017 15:02	ON	N22.15882 E113.92625	69 m	0:00:17	15 kph
7/4/2017 15:02	ON	N22.15812 E113.92606	80 m	0:00:20	14 kph
7/4/2017 15:02	ON	N22.15749 E113.92595	71 m	0:00:18	14 kph
7/4/2017 15:03	ON	N22.15684 E113.92578	74 m	0:00:19	14 kph
7/4/2017 15:03	ON	N22.15629 E113.92560	64 m	0:00:16	14 kph
7/4/2017 15:03	ON	N22.15578 E113.92549	58 m	0:00:15	14 kph
7/4/2017 15:03	ON	N22.15529 E113.92548	54 m	0:00:14	14 kph
7/4/2017 15:04	ON	N22.15464 E113.92544	72 m	0:00:18	14 kph
7/4/2017 15:04	ON	N22.15404 E113.92537	67 m	0:00:17	14 kph
7/4/2017 15:04	ON	N22.15335 E113.92524	79 m	0:00:20	14 kph
7/4/2017 15:05	ON	N22.15259 E113.92504	87 m	0:00:22	14 kph
7/4/2017 15:05	ON	N22.15202 E113.92498	64 m	0:00:16	14 kph
7/4/2017 15:05	ON	N22.15155 E113.92496	52 m	0:00:13	14 kph
7/4/2017 15:05	ON	N22.15098 E113.92493	64 m	0:00:16	14 kph
7/4/2017 15:06	ON	N22.15029 E113.92495	77 m	0:00:19	15 kph
7/4/2017 15:06	ON	N22.14958 E113.92501	80 m	0:00:20	14 kph
7/4/2017 15:06	ON	N22.14907 E113.92519	60 m	0:00:15	14 kph
7/4/2017 15:07	ON	N22.14855 E113.92545	63 m	0:00:16	14 kph
7/4/2017 15:07	ON	N22.14807 E113.92557	55 m	0:00:14	14 kph
7/4/2017 15:07	ON	N22.14759 E113.92569	56 m	0:00:14	14 kph
7/4/2017 15:07	ON	N22.14706 E113.92595	64 m	0:00:16	14 kph
7/4/2017 15:08	ON	N22.14648 E113.92622	71 m	0:00:18	14 kph
7/4/2017 15:08	ON	N22.14585 E113.92647	75 m	0:00:19	14 kph
7/4/2017 15:08	ON	N22.14529 E113.92671	66 m	0:00:17	14 kph
7/4/2017 15:09	ON	N22.14458 E113.92696	83 m	0:00:21	14 kph
7/4/2017 15:09	ON	N22.14407 E113.92719	62 m	0:00:16	14 kph
7/4/2017 15:09	ON	N22.14357 E113.92763	71 m	0:00:19	13 kph
7/4/2017 15:09	ON	N22.14347 E113.92813	53 m	0:00:15	13 kph
7/4/2017 15:10	ON	N22.14368 E113.92880	73 m	0:00:20	13 kph
7/4/2017 15:10	ON	N22.14405 E113.92942	76 m	0:00:20	14 kph
7/4/2017 15:10	ON	N22.14448 E113.92991	70 m	0:00:18	14 kph
7/4/2017 15:11	ON	N22.14498 E113.93033	70 m	0:00:18	14 kph
7/4/2017 15:11	ON	N22.14536 E113.93075	61 m	0:00:16	14 kph
7/4/2017 15:11	ON	N22.14591 E113.93138	89 m	0:00:23	14 kph
7/4/2017 15:12	ON	N22.14630 E113.93181	63 m	0:00:16	14 kph
7/4/2017 15:12	ON	N22.14679 E113.93228	73 m	0:00:19	14 kph
7/4/2017 15:12	ON	N22.14728 E113.93265	66 m	0:00:17	14 kph
7/4/2017 15:12	ON	N22.14778 E113.93313	75 m	0:00:19	14 kph
7/4/2017 15:13	ON	N22.14823 E113.93361	70 m	0:00:18	14 kph
7/4/2017 15:13	ON	N22.14870 E113.93406	70 m	0:00:18	14 kph
7/4/2017 15:13	ON	N22.14915 E113.93443	63 m	0:00:16	14 kph
7/4/2017 15:14	ON	N22.14971 E113.93473	69 m	0:00:18	14 kph
7/4/2017 15:14	ON	N22.15029 E113.93488	67 m	0:00:17	14 kph
7/4/2017 15:14	ON	N22.15088 E113.93502	67 m	0:00:17	14 kph
7/4/2017 15:14	ON	N22.15137 E113.93529	61 m	0:00:16	14 kph
7/4/2017 15:15	ON	N22.15181 E113.93554	55 m	0:00:14	14 kph
7/4/2017 15:15	ON	N22.15227 E113.93571	54 m	0:00:14	14 kph
7/4/2017 15:15	ON	N22.15283 E113.93592	66 m	0:00:17	14 kph
7/4/2017 15:15	ON	N22.15337 E113.93610	63 m	0:00:16	14 kph
7/4/2017 15:16	ON	N22.15396 E113.93612	66 m	0:00:17	14 kph
7/4/2017 15:16	ON	N22.15451 E113.93627	62 m	0:00:16	14 kph
7/4/2017 15:16	ON	N22.15493 E113.93644	50 m	0:00:13	14 kph
7/4/2017 15:17	ON	N22.15557 E113.93663	74 m	0:00:19	14 kph
7/4/2017 15:17	ON	N22.15616 E113.93674	66 m	0:00:17	14 kph

## Appendix I. (cont'd)

Date & Time	EFFORT	Position	Leg Length	Leg Time	Leg Speed
7/4/2017 15:17	ON	N22.15671 E113.93677	62 m	0:00:16	14 kph
7/4/2017 15:17	ON	N22.15732 E113.93690	69 m	0:00:18	14 kph
7/4/2017 15:18	ON	N22.15781 E113.93709	58 m	0:00:15	14 kph
7/4/2017 15:18	ON	N22.15846 E113.93733	76 m	0:00:19	14 kph
7/4/2017 15:18	ON	N22.15902 E113.93744	64 m	0:00:16	14 kph
7/4/2017 15:19	ON	N22.15973 E113.93752	80 m	0:00:20	14 kph
7/4/2017 15:19	ON	N22.16049 E113.93765	85 m	0:00:21	15 kph
7/4/2017 15:19	ON	N22.16098 E113.93775	56 m	0:00:14	14 kph
7/4/2017 15:19	ON	N22.16159 E113.93784	68 m	0:00:17	14 kph
7/4/2017 15:20	ON	N22.16227 E113.93783	76 m	0:00:19	14 kph
7/4/2017 15:20	ON	N22.16293 E113.93796	75 m	0:00:19	14 kph
7/4/2017 15:20	ON	N22.16353 E113.93807	68 m	0:00:17	14 kph
7/4/2017 15:21	ON	N22.16410 E113.93807	64 m	0:00:16	14 kph
7/4/2017 15:21	ON	N22.16486 E113.93815	85 m	0:00:21	14 kph
7/4/2017 15:21	ON	N22.16555 E113.93817	77 m	0:00:19	15 kph
7/4/2017 15:22	ON	N22.16614 E113.93819	65 m	0:00:16	15 kph
7/4/2017 15:22	ON	N22.16675 E113.93823	68 m	0:00:17	14 kph
7/4/2017 15:22	ON	N22.16748 E113.93829	81 m	0:00:20	15 kph
7/4/2017 15:22	ON	N22.16786 E113.93829	42 m	0:00:18	8 kph
7/4/2017 15:23	OFF	N22.16798 E113.93827	13 m	0:00:20	2 kph
7/4/2017 15:23	OFF	N22.16810 E113.93825	13 m	0:00:25	2 kph
7/4/2017 15:23	OFF	N22.16814 E113.93825	4 m	0:00:15	1.0 kph
7/4/2017 15:24	OFF	N22.16816 E113.93825	2 m	0:00:17	0.5 kph
7/4/2017 15:24	OFF	N22.16817 E113.93825	2 m	0:00:15	0.4 kph
7/4/2017 15:24	OFF	N22.16819 E113.93825	2 m	0:00:14	0.6 kph
7/4/2017 15:25	OFF	N22.16822 E113.93825	3 m	0:00:20	0.6 kph
7/4/2017 15:25	OFF	N22.16824 E113.93825	3 m	0:00:13	0.7 kph
7/4/2017 15:25	OFF	N22.16826 E113.93825	2 m	0:00:13	0.5 kph
7/4/2017 15:25	OFF	N22.16830 E113.93826	4 m	0:00:16	0.9 kph
7/4/2017 15:26	OFF	N22.16859 E113.93847	39 m	0:00:14	10 kph
7/4/2017 15:26	OFF	N22.16913 E113.93863	62 m	0:00:15	15 kph
7/4/2017 15:26	ON	N22.16971 E113.93858	65 m	0:00:15	16 kph
7/4/2017 15:26	ON	N22.17026 E113.93855	61 m	0:00:14	16 kph
7/4/2017 15:26	ON	N22.17076 E113.93852	56 m	0:00:13	16 kph
7/4/2017 15:27	ON	N22.17131 E113.93846	61 m	0:00:14	16 kph
7/4/2017 15:27	ON	N22.17198 E113.93849	75 m	0:00:17	16 kph
7/4/2017 15:27	ON	N22.17249 E113.93851	56 m	0:00:13	15 kph
7/4/2017 15:27	ON	N22.17307 E113.93849	65 m	0:00:15	16 kph
7/4/2017 15:28	ON	N22.17370 E113.93847	70 m	0:00:16	16 kph
7/4/2017 15:28	ON	N22.17421 E113.93842	57 m	0:00:13	16 kph
7/4/2017 15:28	ON	N22.17488 E113.93840	75 m	0:00:17	16 kph
7/4/2017 15:28	ON	N22.17524 E113.93840	40 m	0:00:09	16 kph
7/4/2017 15:29	ON	N22.17595 E113.93837	79 m	0:00:18	16 kph
7/4/2017 15:29	ON	N22.17667 E113.93826	80 m	0:00:18	16 kph
7/4/2017 15:29	ON	N22.17743 E113.93813	86 m	0:00:19	16 kph
7/4/2017 15:30	ON	N22.17819 E113.93802	86 m	0:00:19	16 kph
7/4/2017 15:30	ON	N22.17888 E113.93795	77 m	0:00:17	16 kph
7/4/2017 15:30	ON	N22.17904 E113.93794	18 m	0:00:04	16 kph
7/4/2017 15:30	ON	N22.17976 E113.93795	80 m	0:00:18	16 kph
7/4/2017 15:31	ON	N22.18048 E113.93797	80 m	0:00:18	16 kph
7/4/2017 15:31	ON	N22.18111 E113.93796	71 m	0:00:16	16 kph
7/4/2017 15:31	ON	N22.18187 E113.93797	84 m	0:00:19	16 kph
7/4/2017 15:31	ON	N22.18270 E113.93800	92 m	0:00:21	16 kph
7/4/2017 15:32	ON	N22.18354 E113.93801	93 m	0:00:21	16 kph
7/4/2017 15:32	ON	N22.18432 E113.93810	88 m	0:00:20	16 kph
7/4/2017 15:32	ON	N22.18495 E113.93817	70 m	0:00:16	16 kph
7/4/2017 15:33	ON	N22.18555 E113.93816	67 m	0:00:16	15 kph
7/4/2017 15:33	OFF	N22.18586 E113.93813	35 m	0:00:15	8 kph
7/4/2017 15:33	OFF	N22.18598 E113.93810	13 m	0:00:14	3 kph
7/4/2017 15:33	OFF	N22.18602 E113.93808	5 m	0:00:14	1.2 kph
7/4/2017 15:34	OFF	N22.18607 E113.93804	7 m	0:00:24	1.0 kph
7/4/2017 15:34	OFF	N22.18609 E113.93801	4 m	0:00:16	0.9 kph
7/4/2017 15:34	OFF	N22.18612 E113.93799	4 m	0:00:17	0.9 kph
7/4/2017 15:35	OFF	N22.18614 E113.93795	5 m	0:00:20	0.8 kph



## Appendix I. (cont'd)

Date & Time	EFFORT	Position	Leg Length	Leg Time	Leg Speed
7/4/2017 15:35	OFF	N22.18616 E113.93791	4 m	0:00:17	0.9 kph
7/4/2017 15:35	OFF	N22.18617 E113.93787	4 m	0:00:17	0.9 kph
7/4/2017 15:36	OFF	N22.18619 E113.93783	4 m	0:00:19	0.8 kph
7/4/2017 15:36	OFF	N22.18621 E113.93779	5 m	0:00:19	0.9 kph
7/4/2017 15:36	OFF	N22.18622 E113.93774	6 m	0:00:20	1.0 kph
7/4/2017 15:37	OFF	N22.18624 E113.93769	5 m	0:00:20	0.9 kph
7/4/2017 15:37	OFF	N22.18624 E113.93766	4 m	0:00:20	0.7 kph
7/4/2017 15:37	OFF	N22.18624 E113.93762	4 m	0:00:22	0.6 kph
7/4/2017 15:38	OFF	N22.18624 E113.93759	3 m	0:00:18	0.6 kph
7/4/2017 15:38	OFF	N22.18624 E113.93757	3 m	0:00:18	0.6 kph
7/4/2017 15:38	OFF	N22.18624 E113.93753	3 m	0:00:19	0.6 kph
7/4/2017 15:39	OFF	N22.18623 E113.93750	4 m	0:00:19	0.7 kph
7/4/2017 15:39	OFF	N22.18623 E113.93747	3 m	0:00:16	0.7 kph
7/4/2017 15:39	OFF	N22.18623 E113.93745	2 m	0:00:17	0.5 kph
7/4/2017 15:39	ON	N22.18648 E113.93740	29 m	0:00:16	6 kph
7/4/2017 15:40	ON	N22.18719 E113.93737	78 m	0:00:19	15 kph
7/4/2017 15:40	ON	N22.18807 E113.93737	98 m	0:00:22	16 kph
7/4/2017 15:40	ON	N22.18890 E113.93740	93 m	0:00:21	16 kph
7/4/2017 15:41	ON	N22.18964 E113.93742	83 m	0:00:19	16 kph
7/4/2017 15:41	ON	N22.19035 E113.93746	79 m	0:00:18	16 kph
7/4/2017 15:41	ON	N22.19110 E113.93758	84 m	0:00:19	16 kph
7/4/2017 15:42	ON	N22.19185 E113.93763	84 m	0:00:19	16 kph
7/4/2017 15:42	ON	N22.19257 E113.93762	80 m	0:00:18	16 kph
7/4/2017 15:42	ON	N22.19345 E113.93769	98 m	0:00:22	16 kph
7/4/2017 15:43	ON	N22.19427 E113.93781	93 m	0:00:21	16 kph
7/4/2017 15:43	ON	N22.19512 E113.93792	94 m	0:00:21	16 kph
7/4/2017 15:43	ON	N22.19602 E113.93806	102 m	0:00:23	16 kph
7/4/2017 15:43	ON	N22.19629 E113.93811	31 m	0:00:07	16 kph
7/4/2017 15:44	ON	N22.19641 E113.93813	13 m	0:00:03	16 kph
7/4/2017 15:44	ON	N22.19661 E113.93816	23 m	0:00:05	16 kph
7/4/2017 15:44	ON	N22.19732 E113.93815	79 m	0:00:18	16 kph
7/4/2017 15:44	ON	N22.19824 E113.93809	103 m	0:00:23	16 kph
7/4/2017 15:45	ON	N22.19901 E113.93810	85 m	0:00:19	16 kph
7/4/2017 15:45	ON	N22.20000 E113.93822	112 m	0:00:25	16 kph
7/4/2017 15:45	ON	N22.20084 E113.93834	94 m	0:00:21	16 kph
7/4/2017 15:46	ON	N22.20168 E113.93845	94 m	0:00:21	16 kph
7/4/2017 15:46	ON	N22.20261 E113.93855	105 m	0:00:23	16 kph
7/4/2017 15:46	ON	N22.20349 E113.93865	98 m	0:00:22	16 kph
7/4/2017 15:47	ON	N22.20413 E113.93872	72 m	0:00:16	16 kph
7/4/2017 15:47	ON	N22.20494 E113.93873	89 m	0:00:20	16 kph
7/4/2017 15:47	ON	N22.20584 E113.93868	101 m	0:00:22	17 kph
7/4/2017 15:48	ON	N22.20695 E113.93876	124 m	0:00:27	16 kph
7/4/2017 15:48	ON	N22.20776 E113.93890	91 m	0:00:20	16 kph
7/4/2017 15:49	ON	N22.20890 E113.93916	130 m	0:00:28	17 kph
7/4/2017 15:49	ON	N22.20980 E113.93908	101 m	0:00:22	17 kph
7/4/2017 15:49	ON	N22.21066 E113.93900	96 m	0:00:21	16 kph
7/4/2017 15:50	ON	N22.21164 E113.93886	110 m	0:00:24	16 kph
7/4/2017 15:50	ON	N22.21248 E113.93884	94 m	0:00:21	16 kph
7/4/2017 15:51	ON	N22.21337 E113.93889	99 m	0:00:22	16 kph
7/4/2017 15:51	ON	N22.21432 E113.93900	106 m	0:00:24	16 kph
7/4/2017 15:51	ON	N22.21521 E113.93906	100 m	0:00:23	16 kph
7/4/2017 15:52	ON	N22.21625 E113.93876	120 m	0:00:27	16 kph
7/4/2017 15:52	OFF	N22.21688 E113.93857	72 m	0:00:20	13 kph
7/4/2017 15:52	OFF	N22.21714 E113.93852	30 m	0:00:20	5 kph
7/4/2017 15:53	OFF	N22.21727 E113.93854	14 m	0:00:17	3 kph
7/4/2017 15:53	OFF	N22.21736 E113.93858	11 m	0:00:17	2 kph
7/4/2017 15:53	OFF	N22.21736 E113.93885	29 m	0:00:18	6 kph
7/4/2017 15:54	OFF	N22.21705 E113.93915	46 m	0:00:15	11 kph
7/4/2017 15:54	OFF	N22.21661 E113.93957	66 m	0:00:20	12 kph
7/4/2017 15:54	OFF	N22.21622 E113.93996	59 m	0:00:18	12 kph
7/4/2017 15:54	OFF	N22.21595 E113.94024	41 m	0:00:13	11 kph
7/4/2017 15:55	OFF	N22.21583 E113.94045	26 m	0:00:14	7 kph
7/4/2017 15:55	OFF	N22.21581 E113.94053	9 m	0:00:13	2 kph
7/4/2017 15:55	OFF	N22.21581 E113.94055	2 m	0:00:17	0.5 kph

## Appendix I. (cont'd)

<b>Date &amp; Time</b>	<b>EFFORT</b>	<b>Position</b>	<b>Leg Length</b>	<b>Leg Time</b>	<b>Leg Speed</b>
7/4/2017 15:55	OFF	N22.21582 E113.94058	3 m	0:00:17	0.6 kph
7/4/2017 15:56	OFF	N22.21583 E113.94059	2 m	0:00:17	0.4 kph
7/4/2017 15:56	OFF	N22.21586 E113.94061	3 m	0:00:18	0.7 kph
7/4/2017 15:56	OFF	N22.21589 E113.94061	4 m	0:00:19	0.7 kph
7/4/2017 15:57	OFF	N22.21592 E113.94062	4 m	0:00:19	0.7 kph
7/4/2017 15:57	OFF	N22.21594 E113.94063	2 m	0:00:14	0.5 kph
7/4/2017 15:57	OFF	N22.21596 E113.94063	2 m	0:00:14	0.5 kph
7/4/2017 15:57	OFF	N22.21597 E113.94063	1 m	0:00:09	0.5 kph
7/4/2017 15:57	OFF	N22.21597 E113.94063	0 m	0:00:02	0.6 kph
7/4/2017 15:57	OFF	N22.21603 E113.94075	14 m	0:00:07	7 kph
7/4/2017 15:58	OFF	N22.21643 E113.94098	51 m	0:00:15	12 kph
7/4/2017 15:58	ON	N22.21735 E113.94106	102 m	0:00:24	15 kph
7/4/2017 15:58	ON	N22.21834 E113.94123	112 m	0:00:26	16 kph
7/4/2017 15:59	ON	N22.21949 E113.94148	130 m	0:00:30	16 kph
7/4/2017 15:59	ON	N22.22052 E113.94174	117 m	0:00:27	16 kph
7/4/2017 16:00	ON	N22.22129 E113.94218	96 m	0:00:23	15 kph
7/4/2017 16:00	ON	N22.22146 E113.94281	68 m	0:00:17	14 kph

## Appendix II. Survey Effort Database in SWL (April 2017)

(Abbreviations: BEAU = Beaufort Sea State; P = Primary Line Effort; S = Secondary Line Effort)

DATE	AREA	BEAU	EFFORT	SEASON	VESSEL	TYPE	P/S
5-Apr-17	SW LANTAU	2	7.51	SPRING	STANDARD33706	HKCRP	P
5-Apr-17	SW LANTAU	3	9.46	SPRING	STANDARD33706	HKCRP	P
5-Apr-17	SW LANTAU	2	3.70	SPRING	STANDARD33706	HKCRP	S
5-Apr-17	SW LANTAU	3	8.53	SPRING	STANDARD33706	HKCRP	S
7-Apr-17	SW LANTAU	1	0.50	SPRING	STANDARD36826	HYD-HZMB	P
7-Apr-17	SW LANTAU	2	49.66	SPRING	STANDARD36826	HYD-HZMB	P
7-Apr-17	SW LANTAU	3	3.72	SPRING	STANDARD36826	HYD-HZMB	P
7-Apr-17	SW LANTAU	1	3.50	SPRING	STANDARD36826	HYD-HZMB	S
7-Apr-17	SW LANTAU	2	13.05	SPRING	STANDARD36826	HYD-HZMB	S
11-Apr-17	SW LANTAU	1	2.99	SPRING	STANDARD33706	HKCRP	P
11-Apr-17	SW LANTAU	2	10.67	SPRING	STANDARD33706	HKCRP	P
11-Apr-17	SW LANTAU	2	3.45	SPRING	STANDARD33706	HKCRP	S
13-Apr-17	SW LANTAU	1	12.27	SPRING	STANDARD36826	HKCRP	P
13-Apr-17	SW LANTAU	2	6.00	SPRING	STANDARD36826	HKCRP	P
13-Apr-17	SW LANTAU	1	1.90	SPRING	STANDARD36826	HKCRP	S
13-Apr-17	SW LANTAU	2	4.87	SPRING	STANDARD36826	HKCRP	S

### Appendix III. Chinese White Dolphin Sighting Database in SWL (April 2017)

(Abberviations: STG# = Sighting Number; HRD SZ = Dolphin Herd Size; BEAU = Beaufort Sea State; PSD = Perpendicular Distance; ND = Not Determined; BOAT ASSOC. = Fishing Boat Association; P/S: Sighting Made on Primary/Secondary Line)

DATE	STG #	TIME	HRD SZ	AREA	BEAU	PSD	EFFORT	TYPE	NORTHING	EASTING	SEASON	BOAT ASSOC.	P/S
7-Apr-17	3	1552	1	SW LANTAU	2	ND	OFF	HYD-HZMB	808713	811700	SPRING	NONE	
13-Apr-17	1	1354	1	SW LANTAU	1	82	ON	HKCRP	805849	803487	SPRING	NONE	P

**Appendix IV. Individual dolphins identified during HYD-HZMB and AFCD monitoring surveys in SWL waters in April 2017**

<b>ID#</b>	<b>DATE</b>	<b>STG#</b>	<b>TYPE</b>	<b>AREA</b>
WL15	13/04/17	1	HKCRP	SW LANTAU
WL91	07/04/17	3	HYD-HZMB	SW LANTAU



Appendix V. Photographs of Identified Individual Dolphins in April 2017 in SWL waters